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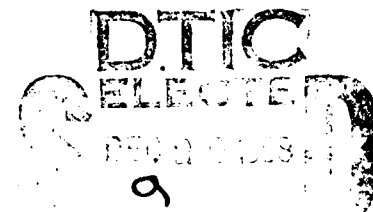
AFIT/GEM/LSM/88S-8

CUSTOMER SATISFACTION WITH  
AIR FORCE CIVIL ENGINEERING SUPPORT

THESIS

Charles M. Groover  
Captain, USAF

AFIT/GEM/LSM/88S-8



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CUSTOMER SATISFACTION WITH  
AIR FORCE CIVIL ENGINEERING SUPPORT

THESIS

Presented to the Faculty of the School of Systems and Logistics  
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the  
Requirements for the Degree of  
Master of Science in Engineering Management

Charles M. Groover, B.S.C.E.

Captain, USAF

September 1988

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Charles M. Groover

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ABSTRACT

This research measured civil engineering customer satisfaction and validated a civil engineering customer satisfaction model developed by Capt Kirschbaum in 1987. The research answered three questions. 1) Do the relationships between overall customer satisfaction and satisfaction with respect to timeliness, quality control, customer orientation, and communications support Kirschbaum's model? 2) How satisfied are customers with civil engineering in terms of timeliness, quality control, customer orientation, communication, and overall support? 3) What do customers expect and what do they perceive civil engineering responsiveness to be for different types of maintenance and repair?

Actual customer satisfaction was found to be most highly related to four factors: responsiveness, the customer service section, facility quality, and grounds appearance. While the Kirschbaum model was very similar, this research found some differences. The two models used different measures of quality. The Kirschbaum model included a communication factor where the Groover model identified grounds appearance as a factor.

Overall customer satisfaction and satisfaction with regard to the contributing factors generally fell in the

neutral to slightly satisfied range. However, over 30 percent of civil engineering customers were neutral to highly dissatisfied with overall civil engineering support. That figure jumped to almost 60 percent for civil engineering responsiveness, the number one contributor to customer satisfaction.

In terms of responsiveness to maintenance and repair problems, civil engineering customers appear to have reasonable expectations but do not perceive civil engineering to be as responsive as desirable.

By validating Kirschbaum's model, this research provides a clear indication of which areas offer the most potential for improving customer satisfaction. In addition, it provides civil engineering with a report card by which to measure future improvements.

## CUSTOMER SATISFACTION AS A MEASURE OF AIR FORCE CIVIL ENGINEERING PERFORMANCE

### I. Introduction

The importance of treating the people that live and work on Air Force installations as customers can not be overstated. Air Force Regulation 85-1 states, "No other base organization directly affects the living environment of every person on base as does the BCE (Base Civil Engineering) organization"(AFR 85-1, 1982:9).

The need for readiness cannot be argued; clearly it is why we live and work in the Air Force. On the other hand, if you can patch a bombed out runway in 30 minutes flat but the pilot who's going to use that runway got out of the Air Force last year because of cockroaches in family housing- we haven't done our job.

In a recent study on long term United States strategy, a blue ribbon commission identified the two worst case scenarios, "a massive conventional attack against NATO by the Warsaw Pact" and "an unrestrained Soviet nuclear attack on U.S. strategic forces," as conceivable but "much less probable than other forms of conflict" (Commission, 1988:

33). Today, the United States has no significant enemies, other than the Soviet Union, that threaten our borders. As a result "major U.S. interests will continue to be threatened at fronts much closer to our adversaries than to the United States" (Commission, 1988: 1).

Consequently, readiness issues are and will continue to be a major concern for civil engineers overseas. However, it may well be that within the continental United States, civil engineering's biggest contribution to readiness will be made through the ability to provide a quality of life that entices highly qualified, motivated individuals to become and remain Air Force members. James F. Boatwright, Deputy Assistant Secretary of the Air Force for Installations, Environment and Safety comments,

Morale and esprit de corps will be measurably enhanced through a quality-of-life program that meets the total needs of our people and their families... The facilities and programs available to off-duty airmen and their families are as important to morale, and subsequently, to readiness as are the skills employed on the job (Boatwright, 1982/3:10).

#### Trend Toward More Innovative Management

In recent years, there has been a resurgence in attention to organizational effectiveness, particularly in the area of innovative management, work force motivation and involvement, and customer service. While much of this has been caused by the transition of the United States economy from an industrial to a service economy (Albrecht

and Zemke, 1985:16), it has also been spurred by the publication of a number of popular books including In Search of Excellence, A Passion for Excellence, The Customer is Key, and others that have heralded many managerial success stories in the corporate world, and to a lesser degree, in the public sector (Peters and Waterman, 1982; Peters and Austin, 1985; Lele and Sheth, 1987). The Department of Defense, the Air Force, and more specifically, Air Force civil engineering have also pursued improved management and customer service with increased vigor (Annual Report to Congress, 1987: 4-6).

As a result, several programs have been established that have had, and are continuing to have, major impacts on the way Air Force civil engineering does business. The Model Installations Program, recently incorporated across the Department of Defense as the Graduate Program, is perhaps is the broadest and most far reaching of these programs. This program promotes ownership and delegates authority to eliminate outmoded and performance-stifling regulations down to the installation level. It encourages testing of new and different ways of doing the job better without requiring excessive justification (1987 Annual Report of the Deputy Assistant Secretary of Defense, 1987:2-3). This program alone has had tremendous impacts on the way Air Force civil engineers do their jobs.

Through the Model Installation Program, at Loring AFB, the civil engineering squadron reorganized from functional shops (carpentry, plumbing, electrical, etc.) into four multi-function teams, each responsible for the maintenance and repair of a quadrant of the base. "The result has been an increase in both quality and quantity of work done for the wing... They [people] seem to like being at work" (The Graduate Gazette, 1987:10-11). This reorganization, titled Readiness and Ownership-Oriented Management (ROOM) was so successful that it has been implemented throughout the Strategic Air Command (Auten, March 1988). A similar program is also being tested in Tactical Air Command (Goodwin, August 1988).

In 1982 and '83, then-Brigadier General Ellis, Deputy Chief of Staff, Engineering and Services, Tactical Air Command cut through major Air Force policies and procedures to put a new Work Information Management System (WIMS) into the hands of the civil engineering community. He had a "tiger team" of base-level managers put together a comprehensive package of reports in just 85 days, a feat the data automation people said would take 20 man-years (Sullivan, 1983:12). The result is a real-time information system that can put the status of a work order or job order in the hands of a manager in minutes.

In 1984, the Tactical Air Command instituted a new PEERS (not an acronym) competition in which civil

engineering squadrons at different bases compete against each other to complete job and work orders faster than ever before (Singel, 1986:4). In just three months, the number of work orders completed in the month they were programmed for accomplishment increased 16.6 percent (Somers, 1986: 1-5).

And finally, in 1984, the Air Force Engineering and Services Center created Project IMAGE (Innovative Management Achieves Greater Effectiveness) and contracted with a consulting firm, Booz-Allen & Hamilton to analyze and identify ways to resolve several historically persistent problems in the way civil engineers do their job. As a result, significant progress has been made in addressing the need for more vehicles, better tools and improved communications systems, etc. (Bravo, 1986:30).

#### Justification For Study

Unfortunately, in spite of the obvious efforts made to improve customer service, no comprehensive or ongoing measure of customer satisfaction has been implemented to determine the effect of these and other changes in Air Force civil engineering support. Nor, in spite of the extensive literature on the subject, has customer satisfaction been tied to the way civil engineering evaluates its performance. This is critical. Nobody better knows the quality of service provided than the

recipient. Zammuto writes, "Each constituency of an organization provides a different window through which performance can be viewed..."(Zammuto, 1982:2-3). Dr. Robert Costello, Assistant Secretary of Defense for Production and Logistics states,

A project that is completed on time, within budget, with pleasing architecture, excellent materials, and quality workmanship is not a quality facility unless the facility meets the user's requirement and promotes top performance by the occupants (Costello, 1987:1).

It becomes clear that the customer, while only one constituency, is a critical one that deserves our attention.

The failure to use customer satisfaction as a measure of performance is not a problem peculiar to the military. In the private sector, although executives rank long-term customer satisfaction as clearly priority number one in importance, the majority of companies do not measure it for purposes of compensation or evaluation (Peters and Austin, 1986:101). Jeffrey Marr, an account director with Walker Research, the fourteenth largest marketing research firm in the country, confirms this:

Based on many years of experience designing customer satisfaction studies in the U.S. over the past 15 years (covering the telecommunications, computer, package delivery, utility, medical equipment, hospital, and banking industries among others), we believe that customer measurement programs have not yet become popular (Marr, 1986:46).

Marr goes on to say,

Many managers perceive that customer feedback tends to be "soft data" for which they would cringe at being held accountable--and this perception is a reality that must be dealt with. This does not mean avoiding customer input; that input is crucial. Rather, there is a need to translate soft customer input into a hard-nosed, quantitative management tool that will be credible to management (Marr, 1986:47).

In spite of the negative perceptions and problems associated with the use of customer service as a performance indicator, there is a strong case for its use, if not exclusively, at least as one of several indicators of performance.

#### Specific Objective of the Research

The primary thrust of this research was to actually measure customer satisfaction with the support provided by civil engineering squadrons across the Air Force. Because the Operations and Maintenance Branch is responsible for the majority of day-to-day maintenance and repair, much of the focus was on the support it provides. This data can now provide a baseline by which to measure future progress and identify particular areas that need attention.

The second goal was to replicate the civil engineering customer satisfaction model developed by Capt Max E. Kirschbaum (Kirschbaum, 1987: 33). In 1987, Kirschbaum surveyed almost a thousand field grade officers and building custodians on what aspects of civil engineering

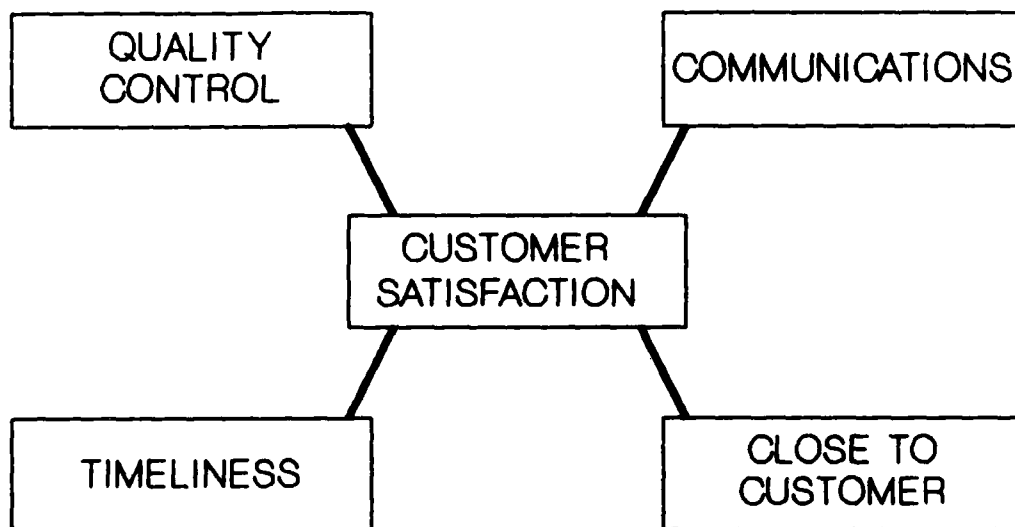


Figure 1: Kirschbaum's Customer Satisfaction Model  
(Kirschbaum, 1987: 33)

they perceived to most impact their satisfaction with civil engineering support (Kirschbaum, 1987: viii, 37). The model resulting from Kirschbaum's study is intuitively appealing in that it includes the factors that most civil engineering officers already recognize to be primary challenges- timeliness, quality control, staying close to the customer, and communications. Where Kirschbaum defined the factors that civil engineering customers perceive to most affect customer satisfaction, this research effort measured actual customer satisfaction with respect to those factors. In theory, if customer perceptions of what factors most impact customer satisfaction are correct, then measuring overall customer satisfaction and customer

satisfaction with respect to those factors should bear out the relationships identified in Kirschbaum's customer satisfaction model.

Assuming that Kirschbaum's model is correct and can be validated, the next step would be to try to quantify customer expectations in terms of performance parameters for each of the underlying factors affecting customer satisfaction. Consequently, as a third goal, this thesis measured customer expectations with respect to timeliness, the most important factor in Kirschbaum's model of satisfaction.

Consistent with past research, customer satisfaction of field grade officers and building custodians was measured. These groups represent those individuals on Air Force bases who have the most contact with civil engineering. Field grade officers, as the base leadership, are accountable for accomplishment of the base mission. As a result, they drive many of the decisions concerning facilities. Building custodians are the representatives of their organizations responsible for interfacing with civil engineering. All requirements for maintenance, repair, and construction are submitted through them to the civil engineering squadron's customer service section.

Additionally, a third group consisting of all other military and civilians that live and work on base, was also surveyed. This third group represents a silent majority

that, in the past, had not been studied with respect to civil engineering customer satisfaction. While many do not have significant contact with civil engineering, they still have attitudes and opinions formed by the quality of the facilities in which they work and live. Since most Air Force bases are fairly small, the third category of individuals probably has greater day-to-day contact than is realized.

#### Investigative Questions

In support of the research objectives, the following investigative questions were answered.

- 1) Do the relationships between overall customer satisfaction and customer satisfaction with timeliness, quality control, customer orientation, and communications support the model developed by Kirshbaum?
- 2) How satisfied are customers with civil engineering in terms of:
  - a. Timeliness
  - b. Quality Control
  - c. Customer Orientation
  - d. Communication
  - e. Overall support
- 3) In terms of timeliness, what do customers expect and what do they perceive civil engineering performance to be for different types of maintenance and repair?

### Scope and Limitations of Research

This study was limited to active duty Air Force installations within the continental United States maintained by Air Force civil engineering squadrons. One exception, the San Antonio Real Property Maintenance Association (SARPMA) has been included. Several Air Force bases as well as other military installations in the San Antonio, Texas area are all maintained by the centralized SARPMA. SARPMA was included because Air Force civil engineering personnel are assigned to and work in this organization.

The survey was designed to answer the investigative questions with respect to Kirschbaum's model. The results were limited by the adequacy of the model and the relevance of the survey questions to the customer satisfaction model.

### Summary

In conclusion, customer satisfaction is an important aspect of performance that should be measured. This thesis attempts to validate Kirschbaum's model to better identify those factors that affect customer satisfaction. In addition, customer satisfaction was measured to provide a baseline by which future improvements in civil engineering support can be measured.

## II. Literature Review

Over the past few years, a myriad of theories have been published on management, customer satisfaction, customer service, quality, and many of the underlying relationships. Prior to developing the research design, current literature was examined to gain an understanding of these relationships. In addition, two other primary questions were researched. First, is there sufficient justification for using customer satisfaction as a tool in the evaluation of individual and organizational performance? And second, what other research has been accomplished concerning customer satisfaction with civil engineering support? This chapter presents a brief summary of the information uncovered on each of these three topics.

### What is Customer Satisfaction?

Webster's New Collegiate Dictionary defines a customer as 'one that purchases, usually systematically or frequently, a commodity or service' (Webster's, 1973: 280-281) and satisfaction as 'fulfillment of a need or want' (Webster's, 1973: 1026). This definition alone implies that customer satisfaction occurs when a product or service purchased fulfills a need or want. Ideally, the product or service would fulfil the need or want for which it was originally sought. It is also reasonable to assume that

the customer's repeated purchase of the commodity or service depends on its successful fulfillment of the customer's need or want.

In The Service Encounter, Czepiel indicates that satisfaction with service is a function of both the functional service as a product and the way in which it is delivered (Czepiel, 1985: 13). He defines satisfaction as "the result of some comparison process in which expectations are compared with that which is actually received" (Czepiel, 1985: 12-13). In Service America!, Albrecht and Zemke confirm that "the receiver's expectations of the service are integral to his or her satisfaction with the outcome" (Albrecht and Zemke, 1985: 37). Czepiel also makes a couple of other fundamental observations. First, he points out that the product is critical. No amount of satisfaction with the encounter between customer and server can compensate for a product not delivered. In fact, Czepiel notes that satisfaction with the encounter can only offset "small deficiencies in functional service quality" (Czepiel, 1985: 13). It is very important to recognize that the product, be it a widget or a service, is the central issue. Undue attention to customer service or other side lights in the face of a poor product is wasted.

In a discussion of service quality, researchers Richard C. Lewis and David M. Klein use somewhat different

terminology. They refer to customer perceptions, expectations, and satisfaction as abstractions. They state that if quality is defined in terms of expectations and perception is the level of satisfaction derived, then the difference between the two is a measure of the quality's existence or non-existence (Czepiel, 1987: 33).

This would indicate that no definition of customer satisfaction is universally accepted; the definition depends somewhat on the issue under study. However, in general, four key ingredients of customer satisfaction emerge as 1) the product, 2) the way in which it is delivered, 3) the customer's expectations, and 4) the customer's perceptions of what is received. Virtually every book and article reviewed in preparing this chapter focused on improving customer satisfaction through the modification and improvement of one or more of these key ingredients.

#### What is Service?

One word that always crops up quickly in a discussion of customer satisfaction is service. Service is defined by Webster's New College Dictionary as "the occupation or function of serving" where "to serve" is defined as

to furnish or supply with something needed or desired . . . to wait on (a customer) in a store  
. . . to furnish professional services to . . .  
to answer the needs of . . . '(Webster's, 1973: 1059).

In comparing Webster's definitions of service and satisfaction, the server provides something to the receiver intended to fill a need or desire. The receiver then achieves some level of satisfaction, good or bad, as a result of this act of service. Note that the server does not control the receiver's satisfaction. The server can only control the product and the way in which it is delivered. The customer's expectations and perceptions are his own. The only way the server has of modifying the receiver's satisfaction is by studying the receiver's needs and desires and how the receiver's expectations and perceptions are formed. The server can then design the product to best meet the receiver's need or desire and design the delivery to maximize its effect on the receiver's expectations and perceptions. But the focus has to be the customer.

While an analysis of Webster's definitions can be used to support an argument that every exchange is an act of service, in reality, the economy is generally segregated into service and manufacturing segments (Albrecht and Zemke, 1985: v).

There are three basic types of service- "help-me" service, "fix-it" service, and "value-added" service that need to be identified and differentiated (Albrecht and Zemke, 1985: 2-9). Currently, almost 60 percent of

Americans work in the service sector providing help-me services in one of four broad segments of the economy:

- Transportation, communication, and utilities.
- Wholesale and retail trade.
- Finance, insurance, and real estate.
- Services-the fastest growing part of the "service sector," which includes business services such as accounting, engineering, and legal firms; personal services such as housekeeping, barbering, and recreational services; and most of the nonprofit areas of the economy.(Albrecht and Zemke, 1985: 2-3)

The next type, fix-it service, refers to that portion of the economy responsible for the repair and maintenance of products ranging from manufactured products to appliances to the home. The third type, value-added service, refers to the quality of encounters between the customer and the server- how well people are treated (Albrecht and Zemke, 1985: 7-9). In terms of how they relate to the key ingredients of customer satisfaction, the first two types of service are product related, while the third dimension is more closely associated with how the product is delivered to maximize the customer's expectations and perceptions.

Air Force civil engineering support falls into all three of these categories of service. Responsible for providing and maintaining utilities, civil engineering also provides engineering and community planning services to the base. Civil engineering maintains and repairs all

facilities on base. And in every aspect of their business, civil engineering personnel deal with people.

Scandinavian Air System's (SAS) president Jan Carlson describes every contact his company makes with a customer as an opportunity for SAS to distinguish itself. He attributes his company's success to these "moments of truth" (Peters and Austin, 1985: 91). Civil engineering also has millions of these "moments of truth" every year--opportunities to distinguish itself.

#### What Factors Affect Customer Satisfaction?

If customer satisfaction is a function of expectations versus perceptions of what was received, then the question becomes one of whether these two functions can be modified by the organization seeking to promote customer satisfaction. The answer is yes to both. Through advertising and interaction with consumers, companies establish a perception of what is to be expected (Lele & Sheth, 1987: 137-8). Theoretically, a company could increase customer satisfaction by reducing the customer's expectations to decrease the difference between that and the customer's perception of what is delivered. Through improvement of the product and delivery to the customer, the company can also improve the customer's perception of what was received.

Czepiel states that service is a function both of the actual functional service and the manner in which it is performed or delivered. While satisfaction is a function of both the service product and the way in which it is delivered, "no amount of transaction encounter satisfaction can compensate for a service never performed" (Czepiel, 1985: 13).

Several models have been developed over time by different people to help explain the relationships surrounding customer satisfaction. Figure 2 presents one

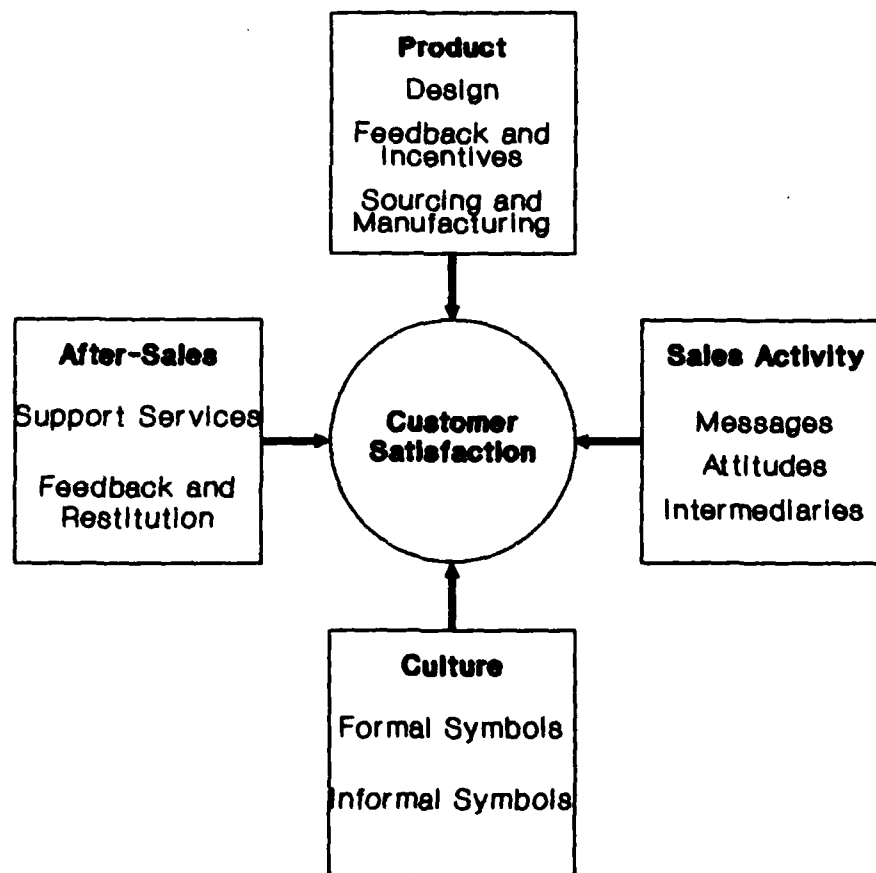


Figure 2: Lele's Four Fundamentals of Customer Satisfaction (Lele & Sheth, 1987: 83)

such model. However, rather than focusing on any particular model, a review of several more common themes relevant to the modification of one or more of the four key ingredients of customer satisfaction was conducted.

Corporate Culture: Every organization has a culture of some type, good or bad. Webster's Dictionary defines culture as "the customary beliefs, social forms, and material traits of a racial, religious, or social group" (Webster's, 1973: 277). In this case, the group is the corporation, company, or civil engineering squadron. Virtually all decisions, and in fact, behavior at all levels is driven by the corporate values that define its culture (Lele & Sheth, 1987: 235). Peters and Waterman found that

Without exception, the dominance and coherence of culture proved to be an essential quality of the excellent companies. Moreover, the stronger the culture and the more it was directed toward the marketplace, the less need was there for policy manuals, organization charts, or detailed procedures and rules. In these companies, people way down the line know what they are supposed to do because the handful of guiding values is crystal clear (Peters & Waterman, 1982: 75-6).

Conversely, companies with mediocre performance often have dysfunctional cultures that focus on things such as internal politics and "the numbers" rather than the customer and the product (Peters & Waterman, 1982: 76). The most successful companies always set their financial

and strategic objectives within the context of their value system (Peters & Waterman, 1982: 284).

Few things are more important than culture. In the private sector, if a company's culture,

does not support a customer-focused attitude then all investments in changing product designs, sales incentives, intermediaries' attitudes, after-sales support, and so forth will be fruitless. Inevitably, once the flush of enthusiasm has worn off, the old cost orientation will reassert itself... (Lele & Sheth, 1987: 103-4).

It is important to note that modifying an organization's culture is very difficult and time consuming. It may take years before any significant improvement is evident (Czepiel, 1987: 6). Yet everything, including the pursuit of customer satisfaction, begins with the organization's values and culture.

Integrity: Although many companies still operate under the motto, "Let the buyer beware," integrity is clearly a central theme in most highly successful corporations today. In Thriving on Chaos, Peters dedicates a six page "prescription" to the issue of integrity (Peters, 1987: 519-23). He stresses the need to establish conservative goals and then deliver (Peters, 1987: 513-4). With the increased uncertainty facing customers, reliability becomes very important in capturing repeat business. Peters writes,

Routinely "over-delivering" to the customer cannot be achieved without more cooperation (among functions in a firm) and greater

commitment within the firm--which again stems from integrity. Engendering wholesale commitment from everyone involves making "deals" (compacts) and living up to them (Peters, 1987: 519-20).

Many companies manage customer expectations by overpromising performance through unreliable and sometimes intentionally misleading advertising. Many companies such as financial services and automobile repair services advertise much higher levels of service than are economically feasible to provide. Others such as airlines may conceal bad news such as delayed flights to prevent customers from transferring to another airline (Lele & Sheth, 1987: 142-3). Yet the more successful companies build their reputations by meeting their commitments at any cost. "Federal Express has been known to deliver a single package via Lear jet to keep a promise to a customer" (Lele, 1987: 45). Frito Lay maintains a 10,000 person sales force in what is a generally recognized low margin market and boasts of a 99.5 percent service level (Peters & Waterman, 1982: 164-5). The top performers carefully manage their customers' expectations by only advertising and making commitments they can meet. Then they do whatever it takes to keep their word (Lele, 1987: 148-51).

Quality The most successful companies are known for setting impossibly high standards for themselves, both in terms of the product and the way it is delivered (Lele & Sheth, 1987: 58). They design their product to maximize

the satisfaction of their most demanding customers (Lele & Sheth, 1987: 67). Maytag washers and dryers are built to withstand use as commercial coin-operated laundries (Lele & Sheth, 1987: 67). Jaguar tests its cars in the most extreme climates it can find. As a result, the cars are built to provide reliability and comfort in the Middle East deserts, during Northern Canadian winters, in the bone-rattling Australian Outback, as well as on the high speed German autobahns. (Lele & Sheth, 1987: 67). A consumer affairs report by the American Management Association relates a funny story that thrusts home the Japanese fetish for quality:

"Let's make it tough on them," said the midwestern purchasing agent, writing out the specifications for the company's first order from a Japanese subcontractor. "On the ball bearings, let's accept no more than three defects in every ten thousand."

Tough it was, far more stringent than the rates allowed to American companies. And so it was with great excitement that the firm opened the Japanese shipment when it arrived. In each crate of ten thousand they found a letter:

Dear Sirs:

Enclosed please find the ball bearings you ordered.

We do not know why you wished to receive three defective bearings with every ten thousand, but we have enclosed them, wrapped separately and identified with cross-hatchings so that you will not mistake them for good ones.

Sincerely-- (Bohl, 1987: 45).

There are equally good stories about service. When Nordstrom, a specialty retailer, once failed to have a suit altered on time for a customer, Nordstrom shipped the suit via Federal Express to the customer on a business trip at a cost of 98 dollars and threw in three 25 dollar silk ties along with a note of apology from the salesman (Peters, 1987: 90).

Finally it is important to note that quality must be judged from the customer's point of view. Ford, IBM, and Miliken are examples of top performers that have incorporated customer perceptions into their quality improvement efforts (Peters, 1987: 82).

Innovation This concept is closely related to quality. The top performers constantly strive to innovate. The key here is that their efforts to innovate are driven by the needs of the customer. And all too often, the bigger companies fail where a small, adaptable, responsive organization succeeds. Among the many rules Peters cites are: start small, keep funding lean and apparatus simple, and invent for the user (Peters, 1987: 199-202). Lele writes,

The reason for this constant innovation--some might call it tinkering--lies in the "impossibly" high standards these companies set for themselves and their refusal to "value engineer" or cut corners on their products. These companies appear to attract, and even encourage, perfectionists who keep pushing to see how the product could be improved further (Lele & Sheth, 1987: 136).

Customer Oriented Communication Kirschbaum's model of civil engineering customer satisfaction identifies customer orientation and communication as separate factors. In this review of the literature, it was difficult distinguishing between the two. Communications is a two way street and the level of communication with the customer seems to be a function of the organization's customer orientation and vice versa.

Yet the importance of this theme in relation to customer satisfaction cannot be overstated. While assessing customer needs differs between companies depending on the industry, company size, and research talent, "successful companies put money--lots of money--into the consumer affairs practices that they consider effective" (Bohl, 1987: 27, 29). A study of techniques used in the private sector revealed several important factors:

- In general, the best initial information is coming from "open-ended" and "high-touch" areas, focus groups, and 800 numbers.
- High-growth companies have very clear ideas about what channels convey the best information --and they spend dramatically higher amounts in maintaining those channels.
- the effectiveness ratings vary widely [by companies surveyed]. Even those "listening tactics" rated lowest by the group as a whole found at least one champion. Conversely, some respondents gave less than complimentary reviews to the favored channels (Bohl, 1987: 15).

In Thriving on Chaos, Peters titles one of his 45 prescriptions for management excellence "Become Obsessed with Listening" (Peters, 1987: 145). In the prescription, he emphasizes the importance of really listening to customers, absorbing the customer's message undistorted, and then providing quick feedback and taking fast action (Peters, 1987: 149). He stresses that many organizations wrongly use their communications to "educate" the customer when they should be listening (Peters, 1987: 153).

This theme of communication includes the sales activity, one of Lele's four fundamentals of customer satisfaction. It also includes managing the customer's expectations through advertising and product literature, as well as managing the atmosphere of the environment where customers have contact with the organization. Lele carries this communication process over into the "after sales" support services provided and the handling of feedback and restitution (Lele & Sheth, 1987: 179-223).

These five themes--corporate culture, integrity, quality, innovation, and customer-oriented communication --represent the most significant themes surrounding the management of customer satisfaction. The themes are so interrelated that the boundaries often blur and it becomes difficult to distinguish where one ends and another begins.

### Aren't Government Organizations Different?

Up to this point, virtually all of the discussion has centered on corporations in the private sector. Air Force civil engineering does not operate under the same conditions and rules that the private sector does. At this point, it is important to recognize the differences between government organizations and businesses in the private sector. Anthony and Young in Management Control in Nonprofit Organizations recognize nine distinguishing characteristics of nonprofit organizations:

- 1) Absence of profit measure
  - 2) Tendency to be service organizations
  - 3) Constraints on goals and strategies
  - 4) Less dependence on clients
  - 5) Dominance of professionals
  - 6) Differences in governance
  - 7) Differences in top management
  - 8) Importance of political influences
  - 9) Tradition of inadequate management controls.
- (Anthony & Young, 1984: 38)

Clearly, the most important difference between the private sector and nonprofit organizations such as Air Force civil engineering is the lack of a profit motive. This profit motive, in the private sector, reduces all activities to the common denominator of dollars. The performance of different branches within a company is easily compared on the basis of dollars in versus dollars out. Decisions in the private sector can usually be reduced to a financial base and then evaluated on their

return to the company. The company's long term survival depends on being able to make a profit. This is not at all true in the government. Anthony and Young write

The absence of a single, satisfactory, overall measure of performance that is comparable to the profit measure is the most serious problem inhibiting the development of effective management control systems in nonprofit organizations. (Anthony & Young, 1984: 39)

One of the most important advantages of the profit motive is that it allows decentralization of decision making to the lowest levels. The goal is well understood at all levels and the measurement of each manager's contribution is also easily based on the profits. Therefore, the risk is easily shared at the profit center level (Anthony & Young, 1984: 40).

The absence of this profit motive results in several unique challenges to nonprofit organizations. The nonprofit organization typically has multiple objectives that cannot be expressed in quantitative terms. Consequently, priorities are much cloudier and more dependent on the personalities and preferences of the individuals involved (Anthony & Young, 1984: 42). There is no accurate method of comparing the costs and benefits of alternate decisions in terms of their contribution to the organization's goals as one might compare alternate capital investments in a private company (Anthony & Young, 1984: 42). Because the primary objective of most nonprofit

organizations is service and cannot be measured in terms of money, it is much more difficult to establish meaningful measures of performance. Consequently, emphasis can be misplaced on minimizing costs instead of maximizing service (Anthony & Young, 1984: 43). As alluded to earlier, the absence of a profit motive obscures organizational goals and measures of performance. These problems, together with the need to balance multiple objectives, force decision making to occur at a much higher level than is normal in the private sector (Anthony & Young, 1984: 43). And finally, different nonprofit organizations and sections within the organizations produce substantially different products. In the absence of the profit measure, there is no universal method for comparing unlike sections and organizations (Anthony & Young, 1984: 43).

Another significant difference faced by non-profit organizations, particularly government, is the inability to choose their products and markets (Anthony & Young, 1984: 44-5). Nowhere is this more evident than in the military. When the defense of our nation is threatened, the Air Force must respond without regard for the site of conflict's accessibility and ease of defense (D'Angelo, 1988).

Perhaps as important as the absence of the profit motive is the source of revenues. Companies in the private sector depend on sales to generate their revenues. In the federal government, revenues are generated through taxation

and allocated, at least on a macro (and some say micro) level, by Congress (Anthony & Young, 1984: 45). Consequently, the quantities of resources available to government agencies are not directly related to their performance or the quality of their product. In fact, where additional customers mean greater revenues in the private sector, they may well represent an additional and unwelcome work load to an already over-worked and underfunded government agency (Anthony & Young, 1984: 46). Additionally, different organizations and sections must compete for limited funds. As a result, undue emphasis is often put on activities pleasing to those who provide resources when the activities are not central to the organization's charter and do not improve performance. Anthony and Young state,

Just as the success of a client-supported organization depends on its ability to satisfy clients, so the success of a public-supported organization depends on its ability to satisfy those who provide resources...Furthermore, acceptance of support from the public carries with it a responsibility for accounting to the public, frequently to a greater degree than exists in a profit-oriented organization. (Anthony & Young, 1984: 47).

One final difference that government organizations face is the civil service.

Civil service laws effectively inhibit the use of both the carrot and the stick. A Civil Service syndrome develops as a result of the tacit caveat signaled by the system structure: "you need not produce success; you merely need to avoid making major mistakes." This attitude is a major

barrier to improving organizational effectiveness. (Anthony & Young, 1984: 54)

In defense of the civil service, it appears that this syndrome is also present to some degree in the military as well.

In summary, there are several significant differences between private sector and nonprofit organizations that affect the way they do business. Private sector firms are much more dependent on their customers for survival than are nonprofit, government organizations. This implies that there may be more justification for using customer satisfaction as a measure of performance in the private sector than in nonprofit organizations like Air Force civil engineering. However, it is important to look at other considerations.

#### With a Captive Audience, Why Focus on Satisfaction?

In The Customer is King, Lele identifies several situations in which it is not appropriate to maximize customer satisfaction, where cost minimization may be more appropriate. One condition occurs when

the buyer has no recourse. In some cases the dissatisfied buyer has no economic, legal, or moral recourse . . . It can also occur when the supplier has a lot of power, for example monopolies or cartels (Lele and Sheth, 1987: 12).

This example is particularly applicable to Air Force civil engineering squadrons, which are organized as monopolies

solely responsible for the maintenance and repair of facilities at base level. Funds for maintenance and repair base-wide are justified and managed by the civil engineering squadrons. Typically, organizations supported by civil engineering have no recourse if they are not satisfied with civil engineering support.

There are several other inherent problems with using customer satisfaction as a measure of performance. One problem is the high operational costs of perfect service. Christopher Lovelock writes,

...a purely marketing mindset that only desires to satisfy the needs of the customer will lead a service firm into bankruptcy...companies run into difficulties trying to achieve customer satisfaction...many have gone bankrupt trying to provide superior service" (Lovelock, 1986: 14).

Linda J. McAleer and Susan J. Levine of the Melior Group in Philadelphia also confirm that offering the wrong service or the wrong levels of service can waste valuable resources (McAleer and Levine, 1984: 4).

Yet, while service can be expensive, it doesn't have to be detrimental to an organization's economic health. Peters writes, "Once the [price/cost] gap is somewhat narrowed,...the winning strategy becomes differentiation--via services, quality, and variety (Peters, 1987: 61-2). Lele and Sheth agree.

When we asked, "How do you resolve the trade-off between cost cutting and investing in customer satisfaction?" with almost monotonous regularity the answer was, "We don't even think of it that way. There is no question of doing trade-off

analyses. If we do what's right for the customer, we know that it will pay off in the long run" (Lele & Sheth, 1987: 53-4).

A Xerox executive may have summed it up best when he stated, "If you give the most accurate service, you will have optimized both the customer and the cost at the same time" (Lele & Sheth, 1987: 16).

Another problem associated with using customer satisfaction as a measure of performance is the high turnover in the military. As discussed in Chapter I, each constituency provides a different perspective from which to measure performance. When the perspectives of all constituencies are aggregated, a complete picture of an organization's effectiveness becomes visible (Zammuto, 1982: 2-3). However, a problem occurs in evaluating civil engineering maintenance and repair of the base infrastructure. Streets, runways, and utility distribution systems deteriorate over years and decades. Maintenance and repair are an ongoing process, which if neglected, may not be noticeable for several years. Because approximately 25 percent of a base's military population move annually, the constituency is not static enough to effectively evaluate maintenance and repair of the infrastructure. Additionally, by the time a problem is noticed, the civil engineering personnel who were negligent probably have also moved. Further, their decisions may have resulted because

insufficient funds were made available by the resource providers, a problem common to nonprofit organizations.

The final problem with using customer satisfaction as a measure of performance is associated with wartime readiness. Although this is changing, there are still civil engineering personnel who, when deployed overseas in the event of war, will not support the same people and wing as in peacetime. If the current wing does not rely on its civil engineering personnel in combat, then wing motivation to maximize and critically evaluate civil engineering readiness training may not be as strong. In this case, the appropriate constituency or customer is not in a position to evaluate civil engineering wartime readiness until in the heat of battle.

Thus far, the emphasis has been on the problems associated with using customer satisfaction as a measure of performance. However, there are several strong, if less quantifiable, arguments for using customer satisfaction as a measure of performance.

The primary argument for using customer satisfaction as a performance measure is that by doing so, the whole orientation of the organization changes to and focuses on the customer, thereby ensuring success. In the private sector, companies that focus on the customer typically earn higher long term profits and are better protected against shifts in technology and customer needs (Lele & Sheth,

1987: 24)). This occurs because they are tuned in to what their customers need, and often push the forefronts of technology in trying to provide it. But because they have established the customer as their priority, they have direction.

Because Air Force civil engineering lacks the profit motive enjoyed in the private sector, the paybacks resulting from focusing on the customer are much more difficult, if not impossible, to measure. However, they still exist. Common sense would indicate that facilities designed and maintained to best support the customer's needs result in a more productive and efficient operation. In the military, this can equate directly to more missions or sorties flown and, in wartime, lives saved.

The story of General Creech, Commander in Chief of Tactical Air Command (TAC) until 1984 and his turnaround of TAC provides an excellent example of what a customer orientation can do. When General Creech took over TAC in 1978, the number of sorties had been dropping at a rate of 7.8 percent annually for ten years. General Creech increased the sortie rate by 11.2 percent annually during his tenure and reduced the turnaround time for launching a fighter aircraft from four hours to eight minutes (Peters and Austin, 1985: 56-7). He did it by establishing the airplane as the customer and motivating and rewarding the support people whose jobs most heavily affected the

productivity of the airplanes. He measured "customer satisfaction" and turned the support people into heroes because of their critical role in promoting "customer satisfaction" (Peters and Austin, 1985: 56-7). While the customer in this situation is a little unusual, the relationships hold true.

Civil engineering supports the people who fly, maintain, and repair the airplanes. If better support can improve our customer's satisfaction and, consequently, his productivity, then the Air Force produces a higher quality product--the defense of this country.

Although managers in the public sector fear seeking feedback on customer satisfaction will result in demands that are too expensive or difficult to implement, this is not the case. Peters writes,

But the reality is that the lion's share of consumers of private and public services are sane and thoughtful. IBM's average customer does not respond to a survey with "Redesign the whole top of the line." The majority of suggestions will be in the line of "You always run out of soup spoons," "The towel dispenser is too high for kids to reach." If you sample regularly, and respond quickly, you will be inundated with small, practical, generally inexpensive--and implementable--ideas. Then both you and the customer/citizen win (Peters, 1987: 104-5).

One practical reason for customer satisfaction as a performance measure is the lack of other effective performance measures available in the absence of a profit motive. Customer satisfaction is an obvious measure that

does not differentiate between profit and nonprofit organizations. Consequently, it would be foolish to ignore its ready availability as a tool.

In summary, there are several reasons for and against the use of customer satisfaction as a measure of performance. While the evidence would indicate that customer satisfaction would be insufficient as a sole measure of performance, its use as a supplemental measure can substantially improve the organizational culture's orientation towards the customer. This in turn results in more effective and efficient use of resources in supporting the customer.

#### What About Research on CE Customer Satisfaction?

The bulk of knowledge concerning measurement of civil engineering customer satisfaction has been gathered through research by Air Force officers pursuing graduate degrees through the Air Force Institute of Technology in the last four years. In 1983, McKnight and Parker developed an organizational effectiveness model for base level civil engineering squadrons. They collected data on some 40 criterion thought to impact organizational effectiveness through a survey of 245 wing, base and civil engineering commanders (McKnight and Parker, 1983:65,79-92). An analysis of the data yielded nine central factors that most contributed to the organizational effectiveness of a civil

engineering squadron. The least important of the factors, customer image, was based on public relations, the image of the civil engineering customer service unit as well as customer satisfaction (McKnight and Parker, 1983:107-109).

Interestingly, the most frequently nominated criterion contributing to customer image was responsiveness, a criterion that was added only because so many respondents listed it as important in response to an open-ended question (McKnight and Parker, 1983:92,100). Nevertheless, this study did support customer satisfaction as a contributing factor to organizational effectiveness.

In 1986, Singel studied the criteria most impacting civil engineering customer satisfaction in the Tactical Air Command for use in the PEERS competition. Data was collected through a survey of 568 senior officers and building custodians at five bases across TAC (Singel, 1986: 4,43). Singel distinguished between customer service and customer satisfaction and found "response to emergency requirements, communications with civil engineering, the quality of service and the attitude of those performing the service as most important to customer service" (Singel, 1986: 66). He found that the civil engineering workforce's professionalism, the customer service representative's attitude and civil engineering public relations were most closely related to customer satisfaction. He went on to define customer satisfaction as "the difference between the

expected level of service and the perceived level of service received" (Singel, 1986:70).

In a 1987 follow-on to Singel's research, Kirschbaum studied the criteria affecting customer satisfaction across all commands. Kirschbaum expanded the population surveyed to include civilian building custodians and initially measured customer satisfaction with respect to the six criteria identified from Singel's research and a review of the current literature (Kirschbaum, 1987:28-29). After analyzing data from 976 surveys across 76 bases, Kirschbaum developed a streamlined customer satisfaction model consisting of four factors (see Figure 1, page 8). The factors were ranked from first to last in importance as timeliness, quality control, staying close to the customer, and communication (Kirschbaum, 1987:36,60-64).

Each researcher's scope was limited to the construction of a model to measure either organizational effectiveness or customer satisfaction; neither had the opportunity to actually use the models. Each researcher included one or two questions (Singel included five questions) concerning the actual level of satisfaction, but none collected sufficient data to provide a reliable baseline identifying the level of customer satisfaction with respect to each primary factor in the respective models.

## Summary

There are four key elements of customer satisfaction: the product, the method of delivery, customer expectations, and customer perceptions of what was received. The serving organization has control only over the product and the method of delivery and must manage these two elements to modify the customer's expectations and perceptions.

Several key areas that affect customer satisfaction are corporate culture, integrity, quality, innovation, and customer oriented communication. However, it is important to recognize that basic differences exist in nonprofit government organizations, such as the lack of a profit motive and a different source of revenues that affect the organization's customer orientation. While there are several reasons for and against the use of customer satisfaction as a measure of performance, in general, the evidence would appear to support customer satisfaction as a supplemental performance measure. Finally, a fair amount of research has already been done on factors impacting customer satisfaction in Air Force civil engineering today.

### III. Methodology

#### Overview

This chapter outlines the methodology and procedures used to collect and analyze data. To answer the three investigative questions in Chapter I, a descriptive study of customer satisfaction in three sample groups was conducted to draw inferences about the population consisting of all Air Force members at bases within the continental United States.

#### Data Collection

Because the sample groups were so large and geographically dispersed, a self-administered questionnaire to be sent through the mail was determined to be the best method of data collection. The survey included five sections: demographics of the respondents, satisfaction with base facilities and the Air Force, civil engineering customer satisfaction, customer response expectations, and a final section consisting of two open-ended questions. A copy of the survey is included as Appendix A.

The second and third sections required responses on a seven point Likert scale ranging from highly dissatisfied to highly satisfied. An eighth category was included labeled 'DON'T KNOW'. The questions in the third section

on customer satisfaction were taken almost verbatim from Kirschbaum's survey, reformatted slightly to measure actual satisfaction instead of perceptions of what impacted customer satisfaction. This was done to avoid the possibility that respondents would misunderstand or interpret a new set of questions differently, thereby jeopardizing efforts to replicate Kirschbaum's customer satisfaction model.

The fourth section consisted of a battery of questions on different situations in which some type of maintenance or repair was required. The respondents were asked to indicate what they thought was a reasonable response time and what they perceived to be the civil engineering squadron response for a given scenario. The eleven scenarios were intended to be representative of routine, urgent, and emergency work, as typically classified by civil engineering.

This approach has two major problems. First, due to the limitations on the length of the survey, the scenarios were not detailed enough to differentiate climates, a detail that often affects the seriousness of a maintenance or repair problem. Second, the number of people who have sufficient experience dealing with maintenance and repair problems similar to those described in the scenarios is probably limited. Ideally, the respondent should be familiar with practices in both the private sector and

civil engineering. Due to these problems and the limited number of scenarios, there was some concern over how robust the results of this section might be. However, this section was intended to be exploratory and to yield additional information on civil engineering customer attitudes concerning timeliness.

#### Population and Sample

The population of civil engineering customers includes all people who live and work on Air Force installations and totals approximately 900,000 (Guide to USAF Bases at Home and Abroad, 1986: 162-171; USAF in Facts and Figures, 1986: 181-192). Samples were selected from three primary groups of people felt to best represent all civil engineering customers:

- 1) Field grade officers.
- 2) Military and civilian building custodians.
- 3) All other military and civilians.

Since work requirements are typically identified to the civil engineering squadron through each organization's building custodians, the third category theoretically does not have any direct interface with civil engineering. However, it is clearly the largest group impacted by the quality of facilities and services provided by civil engineering. Inclusion of the third category also constitutes a significant departure from previous studies

in which field grade officers, squadron commanders, and building custodians were targeted as the respondents.

The sample size was determined based on the two primary methods of analysis used. First, replication of Kirschbaum's model of customer satisfaction using factor analysis required a minimum of 10 respondents per variable included in the factor analysis. Each survey question constitutes a variable. Since 37 questions were included in the survey for this purpose, this technique required a total of 370 respondents (Kachigan, 1986: 384).

The other primary area of analysis, and the one that finally determined the sample size, was the use of analysis of variance (ANOVA) to determine if any significant differences in customer satisfaction existed between the three sample categories or major commands. A balanced, stratified sampling plan consisting of equal numbers of respondents from each category and each major command was developed. Using means and variances for overall customer satisfaction from Kirschbaum's thesis, and in the case of major commands, from McKnight and Parker's thesis, the sample size necessary to achieve a significance level of 0.05 and a power of 0.70 in a one-tailed test was determined for each pair of respondent categories and each pair of major commands (Kirschbaum, 1987: 43; Parker & McKnight, 1983: 135-141). Approximately equal variance between sample groups was assumed. The actual sample sizes

were determined using computations and tables from Kraemer and Thieman's How Many Subjects? (Kraemer and Thieman, 1987: 38-52, 105-106). The largest sample size from the different pairs of respondent categories and the largest sample size from the different pairs of major commands were then used to develop the balanced and stratified sampling plan shown in Table 1. The actual number required was doubled to account for an expected return rate of 50 percent.

Table 1: Stratified Sampling Plan

	Field Grade Officers	Building Custodians	Other Mil & Civ Employees	Total
ATC	88	88	88	264
MAC	88	88	88	264
SAC	88	88	88	264
TAC	88	88	88	264
Other	88	88	88	264
Total	440	440	440	1320

Before samples could be selected for the field grade officer and 'all other' sample categories, the percentages to be drawn from each command were determined based on actual manning across the Air Force. For the 'all other' category, the percentages of civilians and military were

also determined. The percentages were calculated using personnel strengths provided from the Atlas data base at the Air Force Military Personnel Center and the civilian personnel data base at the Civilian Personnel Management Center, both located at Randolph Air Force Base, Texas. Names for the field grade officer and 'all other' sample groups were then randomly selected based on the last one or two digits of their social security numbers.

To build a sample group of building custodians, a letter requesting a copy of building custodian listings was sent to the civil engineering squadron at every Air Force base in the CONUS. Of 86 bases queried, 65 responded with a listing. Using a computer spread sheet with a random number generator, the number of individuals to be drawn from each command was determined. Then, on the same spreadsheet, the random number generator was used to select from which base the individuals in the sample group would be drawn. Finally, using the random number generator on a hand-held computer, the page number and line number were determined for each individual. This method resulted in a stratified sampling plan for building custodians. It insured that the sample was relatively evenly distributed among the commands. However, in major commands with a small number of bases, each base generally contributed a larger percentage of individuals than in major commands with a large number of bases. Conversely, at bases with a

large number of building custodians, the chance of being selected was smaller than at a bases with fewer building custodians.

A randomly selected sample would have been desirable but the problems associated with handling 53 building custodian listings of varied length made this impractical. Ideally, the building custodian listings should have been combined into a single database from which the sample group could be randomly selected without consideration for major command or base.

#### Data Analysis Technique

The survey was designed both to collect data necessary to answer the investigative questions and with specific analysis techniques in mind. For that reason, the analysis techniques will be discussed as they were used to answer the investigative questions.

Investigative Question #1: Do the relationships between overall customer satisfaction and customer satisfaction with timeliness, quality, customer orientation, and communications support the model developed by Capt Kirschbaum?

This question was answered through factor analysis and regression. Factor analysis is a statistical tool used for eliminating "the redundancy in a set of correlated

variables and representing the variables with a smaller set of "derived" variables or factors" (Kachigan, 1986: 378). The use of factor analysis to identify the factors underlying a larger number of variables can provide valuable insight into the relationships occurring within a field of study. For this reason, it is often one of the first steps taken to provide some kind of meaning to the data (Kachigan, 1986: 377, 378). Another use of factor analysis is to reduce a large number of variables to a smaller more manageable set of variables to simplify future data collection (Kachigan, 1986: 380). Perhaps the most applicable example in this case is found in Kirschbaum's research. Kirschbaum collected data on 36 different aspects of civil engineering performance from 944 different respondents. Then, through factor analysis, he was able to represent most of those thirty-six variables with just four underlying factors--timeliness, quality control, customer orientation, and communication (Kirschbaum, 1986: 37-51).

The first stage of factor analysis is to create an  $R \times V$  data matrix where  $R$  represents the number of respondents and  $V$  represents the number of variables. From the data matrix, a  $V \times V$  correlation matrix is computed. This matrix is nothing more than a table of the correlation coefficients that exist for each pair of variables (Kachigan, 1986: 384). In the third phase, a series of operations are performed on the correlation matrix using

matrix algebra to produce a factor matrix consisting of factor loadings. These factor loadings range in value from -1.0 to +1.0 and "represent the degree to which each of the variables correlates with each of the factors" (Kachigan, 1986: 84).

Initially, the factor analysis identifies the same number of factors as there are variables. Typically, the first factor accounts for the greatest amount of variance within the data, followed by the second factor, and so on. Eventually, factors begin to contribute less than an average variable (Kachigan, 1986: 386-8). For example, if 20 factors were identified initially, then at some point factors would begin to account for less than 1/20 of the variance. One rule of thumb for determining how many factors to include is to only include those factors which explain at least an average amount of the variance within the data. This information is typically presented in the form of an eigenvalue which defines the number of variables explained by each factor. Referring back to the example above, the sum of the eigenvalues for all 20 factors would equal 20. Where the first factor might have an eigenvalue of 12 (explaining 12 variables), the last factor might have an eigenvalue of .023. Applying the rule of thumb above, only those factors with an eigenvalue of 1.0 or greater would be retained (Kachigan, 1986: 387).

Once the number of factors to be retained is decided, the next step is to rotate the axes to better distribute the variance explained among the factors retained. Geometrically, one can think of all the data points clustering primarily around one axis and to a lesser degree around a one or two other axes. By rotating the axes, the data is more evenly distributed around all three axes. This gives the axes, which represent factors, better definition (Kachigan, 1986: 389-90). There are many different methods of rotation. For this research effort, only two were considered. The first, orthogonal rotation holds the axes perpendicular to each other based on the assumption that the factors are independent. The second method, promax rotation allows the axes to assume an oblique orientation to each other. This method is useful when there is reason to believe that the factors may be somewhat correlated (SAS, 1985: 338-40). The promax rotation method was used throughout the analysis of data in this study based on the assumption that the factors affecting customer satisfaction are not independent of each other.

Once the factors have been identified and rotated so that a good understanding of how the variables load on each factor is obtained, the researcher then assigns a label to each factor that best describes it. This step is fairly

subjective and depends heavily on the expertise and experience of the researcher.

Factor analysis involves extensive matrix algebra and would be a very tedious and time consuming process if attempted manually. Consequently, all factor analyses were conducted on AFIT's central computer using the SAS statistical software.

Once the factor analysis identified the factors affecting customer satisfaction, the next step was to do a regression on the factors with overall customer satisfaction to define the relationships between the factors and customer satisfaction. A weighted average of the responses for each group of questions loading on a particular factor was used to develop factor scores. Using the factor scores and the responses on overall customer satisfaction, a regression model was developed to define the specific relationship between the factors and overall customer satisfaction. Regression analysis provides "an equation describing the nature of the relationship between two variables" (Kachigan, 1986: 238). Regression analysis essentially plots a best-fitting line through a collection of data points that minimizes the sum of the squared deviations of the data points from the line (Kachigan, 1986: 243). The end product is an equation that includes a y-intercept and a slope for each predictor variable. The

slopes are in reality the regression coefficients and describe the strength of the relationship between the predictor variable and the criterion or dependent variable. The AFIT computer and SAS software were used extensively in this portion of the analysis as well.

Investigative Question #2: How satisfied are civil engineering customers with the support they receive in terms of timeliness, quality control, close to the customer, communication, and overall?

Current levels of satisfaction were determined by computing the means and standard deviations for questions six through fifty-eight. The frequencies of response for each answer on the seven point Likert scale were also examined. The scale used and a sample question are shown in Table 2. After the factor analysis was accomplished to answer the first investigative question, factor scores were then computed for each respondent as weighted averages of the responses for all questions loading on a factor. The factor scores were computed by multiplying the response to each question by a coefficient and summing the products for all questions loading on a factor. The coefficient used was simply the the factor load for each question divided by the sum of factor loads for all questions loading on that factor. Response frequencies, means, and standard

Table 2: Survey Scale and Sample Question

- 
- 1 - HIGHLY DISSATISFIED
  - 2 - MODERATELY DISSATISFIED
  - 3 - SLIGHTLY DISSATISFIED
  - 4 - NEUTRAL
  - 5 - SLIGHTLY SATISFIED
  - 6 - MODERATELY SATISFIED
  - 7 - HIGHLY SATISFIED
  - 8 - DON'T KNOW

How satisfied are you with your civil engineering squadron's performance with respect to each statement below?

1. CE responds quickly to legitimate complaints.
- 

deviations were then computed for each of the factors contributing to customer satisfaction.

Investigative Question #3: In terms of timeliness, what do customers expect and what do they perceive civil engineering performance to be for different types of maintenance and repair?

The analysis conducted on questions 59 through 80 was descriptive in nature. Means and standard deviations were computed for each question and then an one-way ANOVA test was conducted on each pair of questions associated with a scenario. This information provided an indication of how strong the divergence was between expected and perceived actual response times for each type of scenario. Response

frequencies were also reviewed to determine if a large number of civil engineering customers were unwilling or unable to make such subjective determinations.

#### IV. Analysis

This chapter presents the results of the survey, conducts an analysis of the data collected, and provides an interpretation of the analysis results. This chapter focuses on the specific findings and analysis results while Chapter V focuses on the implications of these findings in Air Force civil engineering today.

Of 1400 questionnaires sent to bases within the CONUS, a total of 590 were completed and returned, for a response rate of 42.1 percent. While this fell short of the desired 50 percent response rate by 70 surveys, enough were

Table 3: Return Rate by Sample Group

Sample Group	Surveys Sent	Surveys Received	Percent
Field Grade Officers	450	206	45.7
Building Custodians	500	245	49.0
All other Military and Civilians	450	137	30.4
Unknown		2	0.00
Total	1400	590	42.1

returned to conduct a thorough analysis. A total of 33 surveys were returned unanswered due to wrong addresses, retirement, etc. Table 3 shows the return rates by sample

group. Because the individuals in the sample groups were selected randomly without respect to major command, the actual number of surveys sent to the different commands cannot be determined. The assumption that a random selection process would result in sufficient representation from each command appears to have been correct based on the response rate shown in Table 4.

The actual sample size had been based on obtaining the largest power possible to minimize the possibility of a Type II error. Due to the costs and problems associated with a sample group greater than about 1500, the desired power was set at 70 percent. Because the response rate fell below the desired 50 percent return rate, the power will not be as great.

Table 4: Return Rate by Major Command

Major Command	Surveys Returned	Percent of Total
Air Training Command	117	19.9
Military Airlift Command	106	18.0
Strategic Air Command	147	25.0
Tactical Air Command	108	18.4
Other Commands	110	18.7
Unknown	2	0.0
Total	590	100.0

To prevent any concern over whether the "all other" category has sufficient contact with civil engineering to develop reasonable opinions, Table 5 presents data on how often the different respondent categories have contact with civil engineering. While it is apparent that the "all other" category has significantly less contact with civil engineering than building custodians, 24.8 percent of the "all other" category had never had contact with civil engineering compared to 23.7 percent of the field grade officers. This would indicate that the "all other" category is almost in as good a position, based on frequency of contact with civil engineering, as the field grade officers to assess civil engineering support.

Table 5: Frequency of CE Contact by Respondent Category

Category	Daily	Weekly	1-2 Times/ Monthly	Less Than Once a Month	Never
Field Grade Officers	13	34	34	76	49
Building Custodians	79	83	50	30	3
All Other	13	13	26	51	34

Based on the improved tracking of work and job orders possible with the new WIMS computer system and the high levels of contact apparent here, the role of the building

custodian in tracking all but the biggest work orders may no longer be necessary.

Investigative Question #1: Do the relationships between overall customer satisfaction and customer satisfaction with timeliness, quality, customer orientation, and communications support the model developed by Kirschbaum?

To answer this question, principal components analysis, a form of factor analysis, was conducted on several different combinations of survey questions six through fifty-eight. The analysis was accomplished on the VAX mainframe computer at AFIT using the SAS statistical software program. The different models developed and the factor loadings for each are located in Appendix

Initially, on the chance that the findings would just fall into place, only the 29 questions in Kirschbaum's final model were included in the analysis, while the number of factors was limited to four. The actual number of questions used in the analysis increased by one because the question "Display a courteous and helpful attitude" was expanded to two questions in the questionnaire to distinguish between customer service representatives and craftsmen. As Table 6 on the following page indicates, the questions loaded somewhat differently. The clarity and definition in Kirschbaum's model are not present.

TABLE 6: COMPARISON OF KIRSCHBAUM MODEL  
TO APPLICATION WITH NEW DATA

Kirschbaum's Customer Satisfaction Model (Kirschbaum, 1987: 51)	Test Model Based on Customer Satisfaction Responses
<u>FACTOR 1: TIMELINESS</u>	<u>FACTOR 1</u>
57. Reasonable work start estimates	35. Be prepared on the first visit to job
34. Plan and schedule jobs quickly	39. Get the job done right the first time
23. Complete jobs quickly	33. Keep workers productive in facilities
55. Quick response to work status inquiries	23. Complete jobs quickly
	34. Plan and schedule jobs quickly
<u>FACTOR 2: QUALITY CONTROL</u>	32. Allow more schedule flexibility
26. Establish single point-of-contact	31. Maintain a sense of urgency
32. Allow more schedule flexibility	40. Empathize with problem
42. Eliminate "It's not my job" attitude	18. Quick response to complaints
46. Simplify procedures for complaints	42. Eliminate "It's not my job" attitude
27. Personal attention for complaints	49. Make sure finished jobs are attractive
38. Offer reasonable explanations	38. Offer reasonable explanations
22. Make shop foremen available	<u>FACTOR 2</u>
53. Treat complaints as priorities	22. Make shop foreman available
18. Quick response to complaints	21. Provide information on CE organization
35. Be prepared on the first visit to job	27. Personal attention to complaints
33. Keep workers productive in facilities	20. Explain job before starting
39. Get the job done first time	28. Notification before starting jobs
49. Make sure finished jobs are attractive	53. Treat complaints as priorities
<u>FACTOR 3: CLOSE TO CUSTOMER</u>	<u>FACTOR 3</u>
25. & 44. Courteous, helpful attitude	41. Periodic listings of jobs and status
40. Empathize with problem	54. Updates on work as it progresses
31. Maintain a sense of urgency	56. Discuss finished jobs
52. Listen to my problem	46. Simplify procedures for complaints
	43. Follow-up on finished jobs
	51. Notification and explanation of delays
	57. Reasonable work start estimates

TABLE 6: COMPARISON OF KIRSCHBAUM MODEL  
TO APPLICATION WITH NEW DATA (cont.)

Kirschbaum's Customer Satisfaction Model (Kirschbaum, 1987: 51)	Test Model Based on Customer Satisfaction Responses
<u>FACTOR 4: COMMUNICATION</u>	<u>FACTOR 4</u>
41. Periodic listings of jobs and status	25. Courteous, helpful attitude (Cust Svc)
20. Explain job before starting	44. Courteous, helpful attitude (Craftsmen)
28. Notification before starting jobs	26. Established single point-of- contact
51. Notification and explanation of delays	55. Quick response to work status inquiries
54. Updates on work as it progresses	
56. Discuss finished jobs	<u>DOESN'T LOAD</u>
43. Follow-up on finished jobs	
21. Provide information on CE organization	52. Listen to my problem

In factor analysis, "associated with each derived factor is a quantity known as an eigenvalue, which corresponds to the equivalent number of variables which the factor represents" (Kachigan, 1986:387). Using a rule of thumb that every factor included in a model should have an eigenvalue of at least one (Kachigan, 1986: 387), the principal component analysis indicated that the factors might load better on three factors. When this was tried, seven of the twelve questions loading on the first factor seemed to suggest timeliness, while the last five questions suggested customer orientation. The second factor was very strongly descriptive of communication, while the third factor also focused on being customer oriented.

At this point, it became clear that the questions were not going to load on the factors in Kirschbaum's model. Therefore, it seemed appropriate to start over and consider all available information including several questions that were not included in Kirschbaum's survey. Consequently, a factor analysis was run on all questions six through fifty-eight. This time, the factor analysis yielded eight factors as shown in Table 7. A review of the eight-factor model indicated better defined factors with questions loading more consistently on clearly definable themes. There were still several isolated questions that loaded on inconsistent factors. Questions 34 and 49 both loaded on Factor 1--Customer Oriented Communication--when, in fact,

Table 7: Eight-Factor Model

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Factor 1	- Customer Oriented Communications
Factor 2	- Facility Quality
Factor 3	- Timeliness
Factor 4	- Customer Service
Factor 5	- Civil Engineering Squadron Image
Factor 6	- Base Appearance
Factor 7	- Military Family Housing
Factor 8	- Quality of Air Force Life

---

they were more closely associated with timeliness and quality. Interestingly, questions 24 and 50--which measured overall customer satisfaction--loaded second and

fourth strongest out of eight questions loading on Factor 3 - Timeliness.

Before another analysis was done, the decision to delete Factor 7 - Military Family Housing, Factor 8 - Quality of Air Force Life, and questions 7, 14, 24, and 50 was made. Factor 7 was deleted because only 164 (28 percent) of the respondents live in military family housing. Because SAS deletes the entire observation as the result of one unanswered question for factor analysis, the non-responses to questions on military family housing had to be changed to 'neutral' responses for the previous factor analysis. This effectively compromised any validity of Factor 7. Since there was no other way to avoid compromising this factor, questions 16, 17, and 58 loading on Factor 7 were removed prior to further factor analysis.

Questions 8 and 15 which loaded on Factor 8, Quality of Air Force Life, were also removed prior to the next factor analysis. While there is logic to the argument that satisfaction with Air Force life impacts civil engineering customer satisfaction, this factor is clearly outside the realm of control by civil engineering personnel. Since the purpose behind this research is to identify those factors that can be modified and improved by civil engineering personnel, the questions loading on Factor 8 were removed.

Finally, questions 7, 14, 24, and 50 were also removed. These questions all measured aspects of overall

Table 8: Six-Factor Model

FACTOR 1: CUSTOMER ORIENTED  
COMMUNICATION

- 41. Periodic listings of jobs and status
- 56. Discuss finished jobs
- 54. Updates on work as it progresses
- 51. Notification and explanation of delays.
- 57. Reasonable work start estimates
- 22. Make shop foremen available
- 28. Notification before starting work
- 43. Follow-up on finished jobs
- 21. Provide information on CE organization
- 36. Explain policies and procedures
- 20. Explain job prior to starting
- 46. Simplify procedures for complaints
- 52. Listen to my problem
- 53. Treat complaints as priorities
- 48. Small jobs are given priority

FACTOR 2: RESPONSIVENESS

- 35. Be prepared on the first visit to job
- 23. Complete jobs quickly
- 39. Get the job done right the first time
- 34. Plan and schedule jobs quickly
- 32. Allow more schedule flexibility
- 31. Maintain a sense of urgency
- 33. Keep workers productive in facilities
- 18. Quick response to complaints
- 40. Empathize with problem
- 42. Eliminate "It's not my job!" attitude
- 38. Offer reasonable explanations

FACTOR 3: CUSTOMER SERVICE SECTION

- 25. Courteous, helpful attitude (Cust Svc)
- 26. Established a single point-of-contact
- 29. Provide assistance with paperwork
- 19. Simplify paperwork and coordination
- 27. Personal attention to complaints
- 30. Involves facility user in decisions
- 45. Focus on work, not accuracy of paperwork
- 55. Quick response to work status inquiries

FACTOR 4: FACILITY QUALITY

- 6. Impact of facility condition on morale
- 13. Condition of your building
- 10. Your facility compared to equivalent in private sector
- 12. Impact of facilities on mission

FACTOR 5: CIVIL ENGINEERING IMAGE

- 44. Courteous, helpful attitude (Craftsmen)
- 47. Keep disruptions to a minimum
- 37. Maintain a presentable image
- 49. Make sure finished jobs are attractive

FACTOR 6: GROUNDS APPEARANCE

- 9. Grounds maintenance on base
- 11. Grounds are attractively landscaped

civil engineering customer satisfaction, and were too broad to provide any insight into the factors underlying civil engineering customer satisfaction.

This time, six factors were identified as shown in Table 8 on the previous page. Again, the factors consistently loaded on the same factors as they had in the eight-factor model. Question 34, measuring timeliness, moved from Factor 1 on the eight factor model to a more appropriate place on Factor 2, Responsiveness. Question 49, make sure finished jobs are attractive, also loaded on a more appropriate factor titled Civil Engineering Image. Where Kirschbaum's model had included a factor he titled Timeliness, the second factor in this six-factor model was also associated with timeliness but attracted a more diverse set of questions related providing to faster, more responsive support. Consequently, the second factor was titled 'Responsiveness' instead of 'Timeliness'.

When additional factor analyses were run with other questions left out, these factors continued to emerge fairly consistently. Because the factors were consistent, and all appeared to represent themes consistent to civil engineering customer satisfaction, the six-factor model was adopted as the model best defining the issues underlying the customer satisfaction as addressed by the survey questions.

At this point, the factors were identified, but their relationship to overall customer satisfaction had not yet been defined. The rankings given thus far identify only how strongly or well-defined the factors are, based on the number and strength of questions loading on each factor. To understand the relationship between the factors and overall customer satisfaction, linear regression was used to analyze the relationship between overall customer satisfaction and the factors identified by the factor analysis model.

As an exploratory measure, a linear regression analysis was conducted on the relationship between question 24, overall civil engineering support of the base, and the customer satisfaction questions in the six-factor model to determine the greatest amount of variability that could be explained by the data collected. The multiple correlation coefficient,  $R^2$ , yielded a value of 0.7128 at a significance level of 0.01. This would indicate that the questions used in the six-factor model alone will explain about 71 percent of the variance in overall customer satisfaction. While only 11 of the questions were significant at the 95% level based on the t-test, there appeared to be no evidence of multicollinearity. The tolerance,  $(1-R^2)$ , stayed well above 0.10, a generally accepted limit for avoiding multicollinearity.

Next, the six factors in the model were analyzed. To score the factors, a weighted average of the questions loading on each factor was computed for each observation. This was done so that questions loading heavily on a factor contributed more to the factor score. The weight given to each question was computed by dividing its factor loading by the sum of all factor loadings for a given factor. The factor scores were then used in a regression model with question 24, overall civil engineering support of the base, as the dependent variable and the six factors as independent variables. This time,  $R^2$  yielded a maximum value of 0.6246, again at a significance level of 0.01. Table 9 shows the results of the analysis.

This model has two surprising characteristics. Both Factors 1 and 5 have negative beta coefficients. Intuitively, one would expect an increase in value for these two factors to result in an increase in value for overall customer satisfaction. The beta coefficient, essentially an indicator of the strength of a factor's contribution to the dependent variable, has a very slight slope for both Factor 1 and Factor 5. Coupled with the fact that, based on the probabilities for the F statistic, neither of these factors is significant at the 0.05 level, it is possible that the data does not sufficiently explain

Table 9: Regression Analysis of Six-Factor Model

Factor	Beta Value	Std Error	F	Prob>F
Intercept	-0.0445			
Factor 1: Customer Oriented Communication	-0.1199	0.0707	2.88	0.0903
Factor 2: Responsiveness	0.7444	0.0677	120.75	0.0001
Factor 3: Customer Service Section	0.2552	0.0659	14.98	0.0001
Factor 4: Facility Quality	0.1179	0.0297	15.74	0.0001
Factor 5: Civil Engineering Image	-0.0105	0.0565	0.03	0.8531
Factor 6: Grounds Appearance	0.0828	0.0343	6.18	0.0132

the relationship of these factors to overall customer satisfaction. In any event, these two factors have a negligible impact on customer satisfaction at best. It is suprising that Factor 1, the strongest and most clearly defined factor from the factor analysis does not contribute significantly to overall customer satisfaction. However, the tolerance values are all above 0.1 indicating no evidence of multicollinearity. The rest of the results appear reasonable.

At this point, a new customer satisfaction model emerges. Factor 2, Responsiveness, is the primary

contributor to overall customer satisfaction. The second strongest factor is Factor 3, the Customer Service Section, which focuses on the assistance and courteousness provided by the customer service personnel in civil engineering. The third factor is Factor 4, Facility Quality. Finally, the lowest contributor at a 0.05 significance level is Factor 6, Grounds Appearance. These four alone, if provided to the customer, are an unbeatable combination. The customer's work requests are accomplished effectively and with dispatch, customer service personnel are courteous and assist with in preparing requests. The facilities in which the customer works are maintained at a high level of quality. And the base's general exterior is maintained in an attractive manner. These factors would appear to comprise a model of civil engineering customer satisfaction that is easily defensible. The absence of Factors 1, Customer Oriented Communication, and 5, Civil Engineering Image, is not easily explained. They may be significant at a lower level. Further, the customers don't want to spend a lot of time or develop a lasting relationship with civil engineering personnel, they just want a pleasant, well-maintained environment in which to work, live, and play. Figure 3 presents a revised customer satisfaction model resulting from the factor and regression analyses.

Although the Groover and Kirschbaum models of customer satisfaction differ somewhat, they also have several

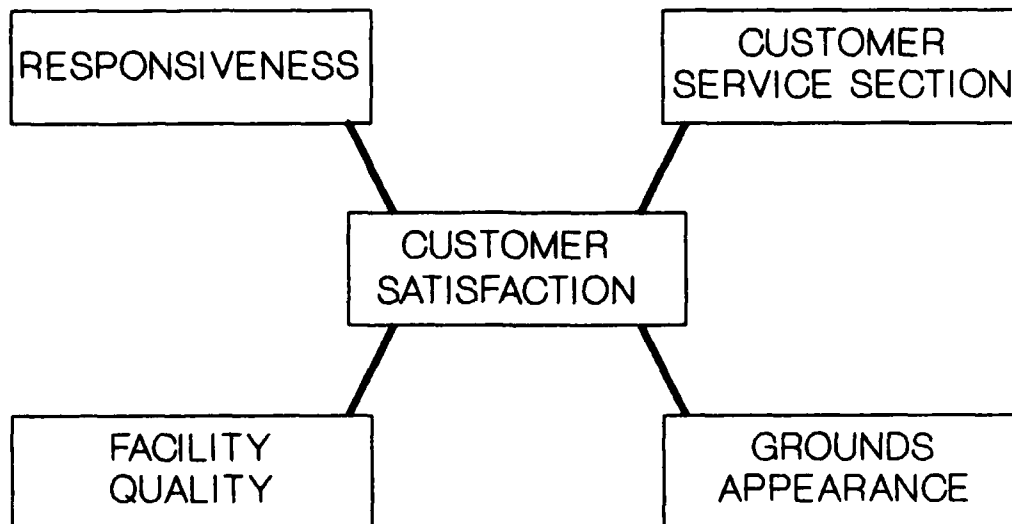


Figure 3: Revised Customer Satisfaction Model

similarities. The factor most highly correlated to overall customer satisfaction in both cases centers on getting the job done quickly. Responsiveness in the Groover model incorporates all but one of the variables (Question 55) in Kirschbaum's timeliness factor. It also includes other questions that loaded on Kirschbaum's quality control factor but which also contribute directly to a timely solution to the customer's problem. The two best examples of this are questions 35 and 39:

- No 35. Be prepared on the first visit to the job.
- No 39. Get the job done right the first time.

These two questions and the others like them are consistent with and further develop Kirschbaum's timeliness factor.

Kirschbaum's second greatest contributor to overall customer satisfaction was quality control. As just pointed out, many of the factors loading on Kirschbaum's quality control factor loaded on Groover's responsiveness factor. However, the third greatest contributor in the Groover model was facility quality. These questions are new and tried to capture respondents' attitudes toward the overall quality and condition of their facilities. While congressional funding for renovation and construction plays a major role in determining the quality of Air Force facilities, civil engineering plays an equal role through identification of facility shortfalls and the day-to-day upkeep of existing facilities. Civil engineering customers recognize this and their satisfaction is in part dependent on it. In effect, Kirschbaum's quality control factor measured on a micro-level the things that determine facility quality as measured on a macro-level. Kirschbaum's quality control and Groover's facility quality factors are consistent with each other. Grounds Appearance, the fourth factor in the Groover model is also a measure of the quality of the base environment on a macro level.

The customer service section factor in the Groover model is only somewhat comparable to Kirschbaum's close to customer factor. The customer service section factor addresses the support customers receive in identifying and

submitting their problems or requirements to civil engineering. This initial contact normally occurs through the customer service section. Where Kirschbaum's close to customer factor addressed the customer orientation of the entire squadron, the customer service section factor in the Groover model addresses the customer's satisfaction with the service and customer orientation of the civil engineering customer service section alone.

Although Factor 1, Customer Oriented Communications, did not significantly contribute to customer satisfaction, it should be noted that Kirschbaum's communication factor ranked last in contribution to customer satisfaction. A significant clue that civil engineering customers want better communications with civil engineering can be found in the open ended responses. Dissatisfaction with the excessive bureaucracy within civil engineering was mentioned 36 different times, while complaints of not being able to obtain information on the status of work and job orders surfaced 25 times. However, analysis of the data indicates that it does not affect overall customer satisfaction significantly.

In summary, the Groover model validates, at least in part, Kirschbaum's customer satisfaction model. Customer satisfaction is driven by responsiveness, customer service, and the quality of facilities and grounds. Although

Kirschbaum's communication factor was not validated, there is evidence that civil engineering customers recognize and even desire customer oriented communication. However, in comparison to the other factors, it has a negligible impact.

Investigative Question #2: How satisfied are customers with civil engineering in terms of:

- a. Timeliness
- b. Quality Control
- c. Customer Orientation
- d. Communication
- e. Overall Support

Before this question was answered, the original investigative question was modified in light of the revised model. Since the data supported a different set of contributing factors, satisfaction was measured in terms of those factors - responsiveness, customer service section, facility quality, and base appearance. Although customer oriented communications and civil engineering image did not contribute significantly to overall customer satisfaction as analyzed by the regression model, satisfaction with these factors is also presented.

Overall Satisfaction Several broad questions were included for possible use as dependent questions; question 24 was considered to be the most encompassing in identifying

overall satisfaction. Table 10 presents the means and standard deviations by respondent category. Table 11 presents them by major command.

Table 10: Overall Customer Satisfaction  
By Respondent Category

Survey Question	Field Grade Officers	Building Custodians	All Other	Total
7. How buildings on base are maintained	5.23 (1.665)	5.00 (1.769)	5.11 (1.569)	5.09 (1.697)
14. Overall quality of facilities on base	5.40 (1.422)	5.12 (1.524)	5.39 (1.331)	5.26 (1.458)
24. Overall CE support of the base	4.65 (1.489)	4.90 (1.841)	5.10 (1.320)	4.88 (1.647)
50. Overall base maintenance and repair	4.85 (1.523)	4.93 (1.694)	5.09 (1.377)	4.67 (1.668)

An analysis of variance was performed across the respondent categories and major commands to determine if the differences in variance were significant at the 0.05 level. Question 24, overall civil engineering support of the base, and each of the factors were analyzed. The field grade officers comprised the only respondent category that was significantly different with respect to question 24, overall civil engineering support of the base. As Table 9 indicates, they have the lowest mean satisfaction. There

Table 11: Overall Customer Satisfaction  
By Major Command

Survey Question	ATC	MAC	TAC	SAC	Other
7. How buildings on base are maintained	5.32 (1.525)	4.98 (1.718)	5.13 (1.835)	5.10 (1.612)	4.86 (1.820)
14. Overall quality of facilities on base	5.49 (1.330)	5.27 (1.383)	5.44 (1.409)	5.09 (1.485)	5.03 (1.628)
24. Overall CE support of the base	4.80 (1.662)	5.09 (1.502)	4.88 (1.812)	4.84 (1.588)	4.791 (1.681)
50. Overall base maintenance and repair	4.949 (1.591)	5.08 (1.506)	5.04 (1.634)	4.88 (1.546)	4.78 (1.627)

were no significant difference among the major commands concerning overall customer satisfaction.

When an ANOVA was done for the factor scores across the respondent categories, differences emerged for Factors 2, 3, and 5. Field grade officers were significantly less satisfied than the other two respondent categories in terms of Factor 2, Responsiveness. The building custodians were significantly more satisfied than the other two categories in terms of Factor 3, Customer Service Section, and Factor 5, Civil Engineering Image.

Interestingly, among the major commands the only significant difference was in Factor 6, Grounds Appearance. Respondents in the Strategic Air Command were significantly

Table 12: Factor Scores by Respondent Category

Factors	Field Grade Officers	Building Custodians	All Others
Customer Oriented Communication	3.99 (0.971)	4.16 (1.429)	4.28 (1.016)
Responsiveness	3.93 (1.241)	4.46 (1.567)	4.42 (1.133)
Customer Service Section	4.34 (0.995)	4.96 (1.276)	4.60 (0.957)
Facility Quality	4.48 (1.703)	4.58 (1.690)	4.81 (1.490)
Civil Engineering Image	4.91 (1.098)	5.48 (1.137)	5.15 (1.140)
Grounds Appearance	5.59 (1.397)	5.56 (1.424)	5.59 (1.342)

Table 13: Factor Scores by Major Command

Factor	ATC	MAC	SAC	TAC	Other
Customer Oriented Communication	4.11 (1.232)	4.24 (1.121)	4.09 (1.132)	4.26 (1.274)	3.95 (1.215)
Responsiveness	4.29 (1.401)	4.51 (1.140)	4.15 (1.348)	4.35 (1.540)	4.04 (1.425)
Customer Service Section	4.64 (1.217)	4.83 (1.046)	4.57 (1.076)	4.70 (1.199)	4.61 (1.189)
Facility Quality	4.76 (1.691)	4.76 (1.566)	4.55 (1.555)	4.60 (1.668)	4.32 (1.789)
Civil Engineering Image	5.20 (1.190)	5.35 (1.093)	5.22 (1.072)	5.24 (1.257)	4.99 (1.133)
Grounds Appearance	5.86 (1.242)	5.47 (1.397)	5.17 (1.519)	5.81 (1.345)	5.69 (1.302)

less satisfied at the 0.05 level with the appearance of base grounds than their counterparts in Air Training Command, Tactical Air Command, and all other commands. The Military Airlift Command, second lowest, was not significantly different from the other major commands. Tables 12 and 13 present the factor scores by respondent categories and major command.

In terms of means and standard deviations, civil engineering customer satisfaction falls slightly to the right of satisfied. However, when the same information is presented as cumulative distributions by percent, the results are somewhat bleaker. Figures 4 and 5 present the cumulative distributions by percent for overall customer satisfaction and responsiveness. Graphs for the other factors are located in Appendix C. When the survey results are examined in this way, it becomes clear that over 30 percent of civil engineering customers are neutral to highly dissatisfied with overall civil engineering support. For civil engineering responsiveness, that figure jumps to almost 60 percent. Clearly, there is room for significant improvement. Further, highly dissatisfied customers offer the highest return if improved civil engineering support can raise their levels of customer satisfaction.

The last area analyzed with respect to customer satisfaction was the open-ended responses. Appendix E contains all 294 responses in their entirety. The types of

Figure 4: Overall Customer Satisfaction

Cumulative Distribution by Percent

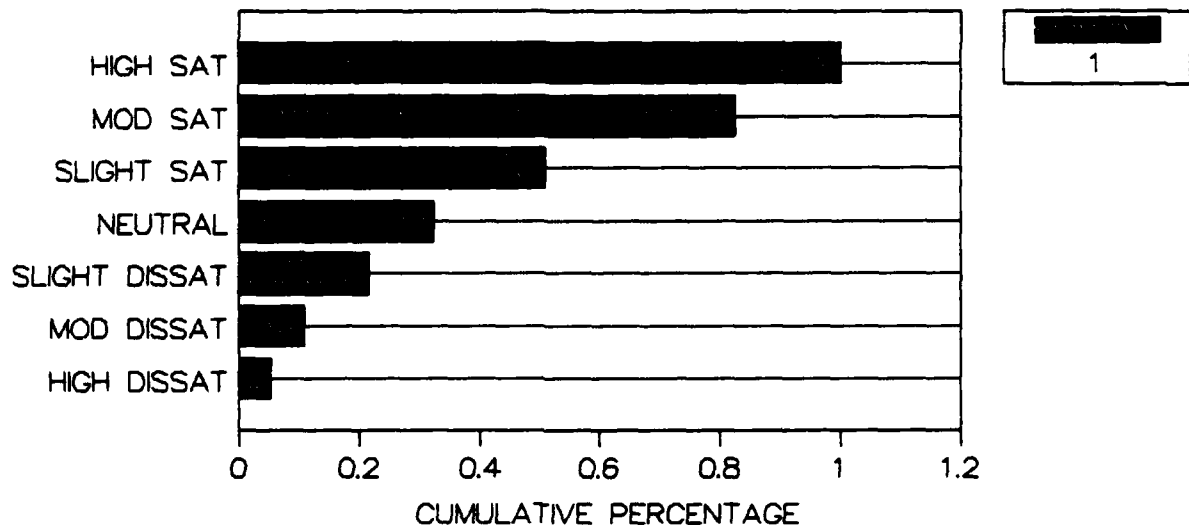


Figure 5: Responsiveness

Cumulative Distribution by Percent

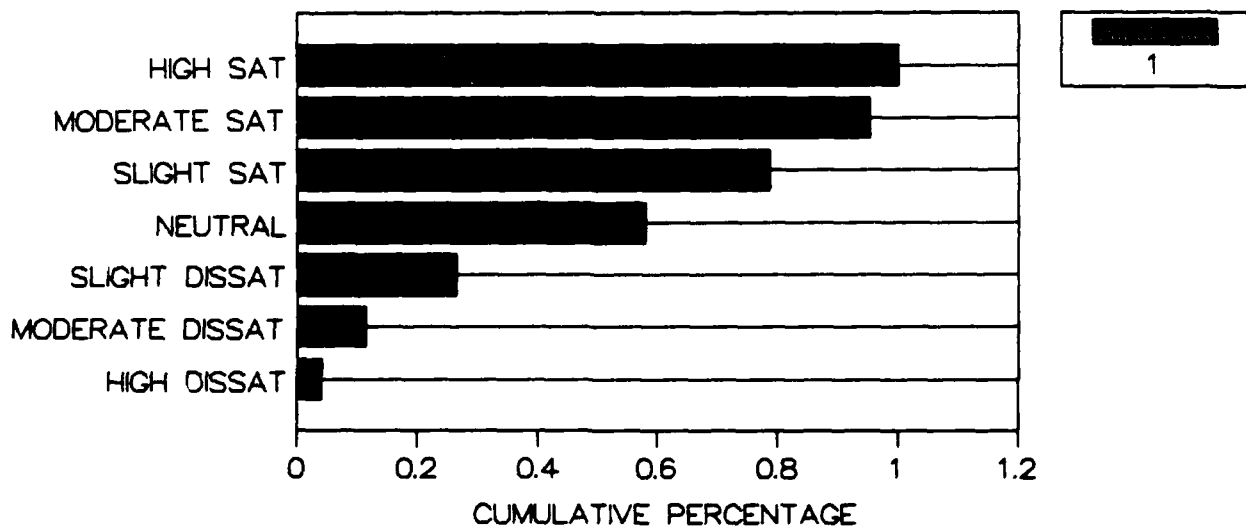


Table 14: Types of Open-ended Responses

Category	Number of Responses
Slow CE Response	55
Need New Facilities	42
Good CE Support	39
Inadequate Funding	38
CE Too Bureaucratic	36
New Facilities, Ongoing Construction and Renovation on Base	32
Poor Heating/Air Conditioning/Ventilation	28
Good Facilities	27
Difficult to Get Status From CE	25
Facilities Well-Maintained	22
Poor Contractor Performance/Support	18
Poor Craftsmanship	16
Too Much Emphasis on Senior Officer Facilities	15
Self-Help Effective Contribution to Base Maintenance	15
Work Requests/Orders Lost or Closed Prematurely	13
Self-Help Abused By CE	13
Inadequate Benchstock and Material Support	10
Have to Pull Rank to Get Results	10
Priorities Poor and/or Constantly Changing	10
Good Family Housing Maintenance Support	9
Housing Too Small	8
Poor Family Housing Maintenance Support	7
Inadequate Work and Office Space	7
Inadequate Material Support for Self-Help	6
Ashamed of Facilities	6
Too Much Emphasis on Appearances	6
Inadequate Facility Maintenance	6
Nice Landscaping	5
Poor Street and Road Maintenance	5
Total	529

responses have been categorized in Table 14. At the top of the list is concern over civil engineering responsiveness, followed by "need new facilities." There were several other interesting categories. One frequent response was praise for all the new construction underway or recently finished. This is not surprising in view of the relative prosperity the military has enjoyed since the early 1980's. However, it is indicative that progress was being made up until recently. The seriousness of the current funding problems faced at base level were also thrust home by the number of times it was mentioned. Respondents often addressed several different issues; that is why the total in Table 14 exceeds 294. Finally, realize that the individuals who responded to the open-ended questions were self-selected and may not be representative of the Air Force population at large.

Investigative Question #3: In terms of timeliness, what do customers expect and what do they perceive civil engineering performance to be for different types of maintenance and repair?

The data collected in this survey can be classified as exploratory at best. As mentioned in Chapter 3, the depth and detail provided can only provide the roughest feel for customer expectations and perceptions with regard to actual response times. Further, these responses provide only an

Table 15: Desired versus Expected Response Rates

Maintenance and Repair Scenarios	Desired Response	Perc'ved CE Response	F	Prob>F
The roof on your home is leaking in two places at a rate of one gallon an hour.	1.80 (1.556)	2.86 (1.835)	102.41	0.0000
Your bathroom faucet has a leaky faucet.	3.79 (2.023)	3.79 (1.761)	0.00	0.9242
A window pane in your living room is broken accidentally in the middle of winter.	2.40 (1.974)	2.86 (1.750)	15.17	0.0002
Your office building's heater breaks down in the middle of winter.	1.69 (1.058)	2.49 (1.587)	95.25	0.0000
Your home's air conditioner breaks down in the middle of summer.	2.48 (1.208)	3.33 (1.619)	88.07	0.0000
You decide that your office area needs to be renovated to improve working conditions.	5.23 (1.401)	6.00 (1.459)	71.17	0.0000
One of four toilets in the office restroom becomes stopped up.	2.68 (1.561)	3.15 (1.701)	22.02	0.0000
The power goes out during an electric storm in mid-summer.	1.51 (1.102)	1.83 (1.414)	16.64	0.0001
An ice storm knocks out your power in mid-January.	1.55 (1.140)	1.97 (1.541)	25.73	0.0000
The paint on your house is flaking off.	5.31 (1.482)	5.95 (1.288)	51.90	0.0000
The faucets in your office work but look corroded and grungy.	5.07 (1.612)	5.67 (1.450)	38.85	0.0000

Scale For Desired and Perceived Responses

1 - Within Four Hours  
 2 - Within One Day  
 3 - Within Two Days  
 4 - Within One Week  
 5 - Within One Month

6 - Within Six Months  
 7 - More Than Six Months  
 8 - Would Not Hire Craftsman,  
     Would Fix It Myself  
 9 - Don't Know

indication of the customers' perceptions, not any indication of civil engineering performance. To analyze the data collected in Part IV - Customer Response Expectations, an analysis of variance was performed to determine if in fact there was a significant difference between the desired response time and the perceived response time for each scenario. Table 15 presents a summary of these findings. With the exception of the second scenario, every situation was statistically significant at the 0.05 level or greater. As might be guessed, people always seem to want anything sooner than they can have it. However, while the means were statistically significant, the actual difference in terms of timeframe were not as great as might be expected. The number of "Would not hire craftsman, would fix it myself" responses ranged from a low of two to a high of forty-nine. The high went to the second scenario, "Your bathroom has a leaky faucet." This is consistent with the fact that desired and perceived response times for this scenario were not significantly different- presumably, respondents felt like this was not a very difficult or high priority job.

### Summary

While there were significant differences, Kirschbaum's model was, for the most part, validated by this research. Responsiveness, customer service, and quality are primary

issues affecting customer satisfaction. Many of the differences in the models may be the result of differences in customer perceptions of what affects customer satisfaction and their actual satisfaction. People's perceptions are rarely 100 percent consistent with reality. In terms of actual customer satisfaction, most respondents were just to the right of neutral. This does not appear to be exceptionally good or bad until the percentage of customers falling into the neutral to highly dissatisfied range is analyzed. There would appear to be significant room for improved customer support based on the data. Finally, customers perceive a difference between desired and actual response times. Further, the differences are not great, and customer expectations appear reasonable.

## V. Conclusions and Recommendations

### Conclusions

While the results of the data analysis were less than 100 percent conclusive, valuable insights into civil engineering customer satisfaction can be made. Further, these insights provide guidance for the civil engineering manager as to what areas of civil engineering performance offer the most potential for improved customer satisfaction.

The Model Although the Groover and Kirschbaum models of customer satisfaction differ somewhat, they do have several strong similarities. Both ranked getting the job done quickly first. Although Groover and Kirschbaum measured quality differently, they both identified it as a major contributor to customer satisfaction. Both models included customer service as primary factors, although Groover's model focused primarily on the customer service section. The one major difference was the exclusion of the communications factor in the Groover model. Kirschbaum ranked this factor lowest in his model. Further, some differences were to be expected. Kirschbaum measured peoples' perceptions of what most impacts customer satisfaction. Groover measured actual customer satisfaction. In reality, the measurement of actual customer satisfaction should yield more accurate results.

Peoples' perceptions often differ from reality. Clearly though, there is sufficient consistency between the two models to provide direction to the civil engineering community in improving customer support and satisfaction.

Customer Satisfaction There is no right or wrong answer concerning what level of customer satisfaction is acceptable. Every individual has his own internal range of comfort. As the results in Chapter IV indicate, civil engineering customers are, on the whole, slightly satisfied. Yet over 30 percent of civil engineering customers are neutral to highly dissatisfied with overall civil engineering support. Almost 60 percent are neutral to highly dissatisfied with civil engineering responsiveness, the number one contributor to customer satisfaction.

When British Airways conducted market research, they found that 20 percent of air travelers interviewed considered British Airways superior to other airlines. Another 15 percent considered British Airways inferior while the remainder had no strong opinion. While company management initially took the optimistic viewpoint that 85 percent of the respondents thought they were alright, they soon realized that, in fact, 65 percent of the respondents couldn't differentiate between British Airways and the other airlines. Since their goal was to be the best

airlines in the world, this was very bad news (Albrecht and Zemke, 1985: 35).

Judging from the data collected, Air Force civil engineering faces a similar predicament. Will it choose to establish an environment of excellence or continue to provide mediocre service to the people and organizations it supports at base level?

Customer Response Perceptions and Expectations This area of the research plan was perhaps the least developed of the three. However, there were several lessons here also. First, civil engineering customers have opinions on what is a reasonable response time. Second, average response times identified by civil engineering customers do not appear grossly unreasonable. Third, civil engineering customers perceive that civil engineering is not responding as quickly, on average, as desired. One piece of data that is missing is the actual average response times for civil engineering for the scenarios described in the survey. This data would complete the picture.

### Recommendations

Recommendations fall into two categories, operational changes and further research.

Operational Changes Many of the obstacles to improved civil engineering support are systematic and beyond control of the base level civil engineer. Generally

speaking, civil engineering personnel work hard in support of the bases.

One solution to the lack of a profit motive might be to reroute funding for base maintenance to using organizations and establish an industrial fund within civil engineering for day-to-day operation. This approach has several benefits.

First, there has been much talk of ownership--this concept really puts responsibility on the facility owner. The facility owner would have complete control over the funds for the maintenance and repair of his facility and would establish his own priorities. The facility owner could go downtown if he felt he could obtain better support from a private company. Self-help would be determined by the facility owner based on funds availability and organizational capabilities, not what civil engineering could or could not support. While civil engineering would assist in budgeting, facility owners would identify funding requirements for maintenance and repair through their own chain of command. This has the benefit of involving the functional commanders at the highest levels in justifying and fighting for necessary maintenance and repair resources.

Conversely, civil engineering would have to earn the facility owner's business. Civil Engineering would provide each organization with an account of how their funds were

spent at the time the organization was billed. As a result, a better system for tracking and managing individual facility maintenance and repair costs would probably evolve. Civil engineering would develop more realistic costs for different services in order to be more competitive with companies downtown. Since civil engineering would have to base prices on true costs, manpower could be tied to what civil engineering could fund based on income. As a result, the civil engineering organization would probably become much leaner and more efficient.

Most important, civil engineering would be removed from the driver's seat in which it currently, to a large degree, sells its priorities for maintenance and repair to the base. Instead, the organizations being supported would be in control. In this environment, a server-client relationship based on mutual need would evolve, and a strong customer orientation could much more easily be instilled and perpetuated.

Civil engineering customer satisfaction needs to be measured at base level on a recurring basis. Civilian and military personnel evaluations need to be tied to customer satisfaction and the factors that contribute to it. Because Air Force civil engineering resources come from a different source than the customer, it is too easy to lose

sight of the customer as the central focus of the organization.

Further Academic Research Further academic research should be conducted in several areas. First, the actual relationship between communications with civil engineering and customer satisfaction needs to be better defined.

Second, a streamlined customer satisfaction survey and sampling plan need to be developed to simplify ongoing measurement of customer satisfaction at base level. The survey used in this research might provide a good starting point.

Third, standards for performance based on customer needs and expectations should be developed. Civil engineering currently allows its capabilities to drive support. Instead, the needs of the customer ought to be driving capabilities.

## Appendix A

### AFIT SURVEY OF CUSTOMER SATISFACTION WITH BASE CIVIL ENGINEERING SUPPORT

#### GENERAL INFORMATION

This questionnaire measures how satisfied you are with the performance of your base's civil engineering squadron in providing and maintaining the facilities in which you work and possibly live. To better understand what affects overall satisfaction, satisfaction with several areas of performance thought to contribute to overall customer satisfaction such as timeliness, quality, and communications are also measured. Finally, the questionnaire measures what you think is a reasonable response time from a repairman and what you perceive to be your base civil engineering squadron's response rate.

The information collected will be used to identify what aspects of civil engineering performance most impact customer satisfaction, which areas most need attention and improvement, and what are reasonable goals in terms of civil engineering responsiveness.

Please be assured that all information you provide will be held in the strictest confidence. Your individual responses will not be provided back to base level civil engineering or to any other agency.

#### INSTRUCTIONS

This questionnaire has 82 questions broken into five parts. All questions but the last two must be answered by filling in the appropriate spaces on the machine-scored response sheet provided. If for any question, you do not find a response that fits your situation exactly, use the one that is closest to the way you feel.

Please answer all questions to the best of your knowledge. It is important to distinguish between "DON'T KNOW" AND "NEUTRAL". Only mark the circle labeled 'DON'T KNOW' if you don't have enough information with which to make a decision. Although some questions may require a more in-depth knowledge of civil engineering than you think you have, please answer as well as you can. Your responses are important.

Please use a "soft-lead" (No. 2) pencil, and observe the following:

1. Make heavy black marks that fill in the space (of the response you select).
2. Erase cleanly any responses you wish to change.
3. Make no stray markings of any kind on the response sheet.
4. Do not staple, fold, or tear the response sheet.

Each response block has 10 spaces (numbered 1 through 10). The questionnaire items normally require a response on a scale of 1 to 8 or 1 to 9. Therefore, block 10 and often block 9 will not be used. Questionnaire items are responded to by marking the appropriate space on the answer sheet as in the following example:

- 1 - HIGHLY DISSATISFIED
- 2 - MODERATELY DISSATISFIED
- 3 - SLIGHTLY DISSATISFIED
- 4 - NEUTRAL
- 5 - SLIGHTLY SATISFIED
- 6 - MODERATELY SATISFIED
- 7 - HIGHLY SATISFIED
- 8 - DON'T KNOW

Sample item 1:

CE customer service representatives display a courteous and helpful attitude.

(If you are "moderately satisfied" with sample item #1, you would "blacken in" the corresponding number of that statement (moderately satisfied = 6) on the answer sheet for item numbered "Sample item 1.")

Sample response:    1   2   3   4   5   6   7   8  
                     0   0   0   0   0   ●   0   0

## PART I - BACKGROUND INFORMATION

Please select the answer that best describes your current position at your base.

1. What is your rank or grade?

1. Major through Colonel
2. Second Lieutenant through Captain
3. Master Sergeant through Chief Master Sergeant
4. Sergeant through Technical Sergeant
5. Airman Basic through Senior Airman
6. GS-10 and WG-10 or higher
7. GS-1 through GS-9
8. WG-1 through WG-9
9. Other

2. Are you now or have you ever been a building manager?

1. Yes
2. No

3. What is the host command at your base?

1. Air Training Command
2. Air Force Logistics Command
3. Air Force Systems Command
4. Military Airlift Command
5. Tactical Air Command
6. Strategic Air Command
7. Other

4. Do you live in base military family housing?

1. Yes
2. No

5. Please estimate how often you have direct contact with the civil engineering squadron at your base.

1. Daily
2. Weekly
3. Once or twice a month
4. Less than once a month
5. Never have had contact

## PART II - BASE FACILITIES

Each of the statements below measures some aspect of the facilities or quality of life in the Air Force. For each statement, please indicate your level of satisfaction based on conditions at your current base. Use the rating scale below when considering each item and darken the appropriate circle next to the corresponding number on the answer sheet provided.

- 1 - HIGHLY DISSATISFIED
- 2 - MODERATELY DISSATISFIED
- 3 - SLIGHTLY DISSATISFIED
- 4 - NEUTRAL
- 5 - SLIGHTLY SATISFIED
- 6 - MODERATELY SATISFIED
- 7 - HIGHLY SATISFIED
- 8 - DON'T KNOW

How satisfied are you:

- 6. With the impact the condition of your facilities have on your organization's morale?
- 7. With how well the buildings on your base are maintained?
- 8. With the quality of life offered by a career (military or civilian) with the Air Force?
- 9. With how the grounds on base are maintained?
- 10. With the facility you work in compared to what you would expect in an equivalent job in the private sector?
- 11. That the grounds on base are attractively landscaped?
- 12. With the impact that your organization's facilities have on the accomplishment of its mission?
- 13. With the condition of the building that you work in?
- 14. With the overall quality of facilities on base?
- 15. That the quality of life offered by the Air Force is equal to or better than that available to you in the private sector?

NOTE: If you do not live on base, please skip questions no. 16 and 17 and go on to Part III.

- 16. With the condition of military family housing?
- 17. With the housing on base compared to what you could obtain off-base on your current salary?

### PART III - CIVIL ENGINEERING CUSTOMER SATISFACTION

For each of the following statements, please indicate your level of satisfaction with your current base civil engineering squadron's performance. Use the rating scale below when considering each item and fill in the appropriate circle next to the corresponding number on the answer sheet provided.

- 1 - HIGHLY DISSATISFIED
- 2 - MODERATELY DISSATISFIED
- 3 - SLIGHTLY DISSATISFIED
- 4 - NEUTRAL
- 5 - SLIGHTLY SATISFIED
- 6 - MODERATELY SATISFIED
- 7 - HIGHLY SATISFIED
- 8 - DON'T KNOW

How satisfied are you with your civil engineering squadron's performance with respect to each statement below?

- 18. CE responds quickly to legitimate complaints.
- 19. CE has simplified or reduced paperwork and coordination requirements where possible.
- 20. CE representatives explain the proposed job prior to starting.
- 21. Sufficient information is provided on the CE organization and how it operates.
- 22. CE lets customers deal directly with shop foremen about specific complaints.
- 23. Once started, jobs are completed quickly.
- 24. Overall CE support of the base.
- 25. CE customer service representatives display a courteous and helpful attitude.
- 26. CE has established a single point-of-contact within CE for all communications.
- 27. Complaints to CE personnel receive personal attention.
- 28. CE provides adequate notice before starting work.
- 29. CE customer service representatives provide assistance and direction for completing paperwork.
- 30. CE involves you as the user in decisions involving maintenance and repair to the facility where you work.

- 1 - HIGHLY DISSATISFIED
- 2 - MODERATELY DISSATISFIED
- 3 - SLIGHTLY DISSATISFIED
- 4 - NEUTRAL
- 5 - SLIGHTLY SATISFIED
- 6 - MODERATELY SATISFIED
- 7 - HIGHLY SATISFIED
- 8 - DON'T KNOW

How satisfied are you with your civil engineering squadron's performance with respect to each statement below?

- 31. CE personnel maintain a sense of urgency.
- 32. The CE organization allows the flexibility to fix all problems once discovered.
- 33. All CE workers are kept productive when working on a job in my facility.
- 34. CE plans and schedules jobs quickly.
- 35. CE craftsmen are fully prepared to complete the job on the first visit.
- 36. CE completely explains policies, procedures, and coordination requirements in advance.
- 37. CE personnel maintain a presentable image.
- 38. CE representatives offer reasonable explanations to complaints.
- 39. CE craftsmen get the job done right the first time.
- 40. CE personnel empathize with my problem and treat it as an important request.
- 41. CE provides periodic listings of all my work orders and their status.
- 42. CE has eliminated the attitude that "It's not my job!" or "You need to call \_\_\_\_\_."
- 43. CE follows up to make sure jobs were done correctly.
- 44. CE craftsmen display a courteous and helpful attitude.
- 45. CE personnel focus on requested work, not on accuracy of the paperwork.
- 46. CE has provided a simple mechanism to allow customers to express legitimate complaints.

- 1 - HIGHLY DISSATISFIED
- 2 - MODERATELY DISSATISFIED
- 3 - SLIGHTLY DISSATISFIED
- 4 - NEUTRAL
- 5 - SLIGHTLY SATISFIED
- 6 - MODERATELY SATISFIED
- 7 - HIGHLY SATISFIED
- 8 - DON'T KNOW

How satisfied are you with your civil engineering squadron's performance with respect to each statement below?

- 47. CE craftsmen working in my building keep disruptions to a minimum.
- 48. Small jobs are given priority.
- 49. CE makes sure finished jobs are attractive.
- 50. Overall CE maintenance and repair of the base.
- 51. CE personnel provide notification and explanation of work delays.
- 52. CE representatives listen to my problem and try to understand it from my perspective.
- 53. CE treats complaints on completed jobs as priorities.
- 54. CE craftsmen and foremen discuss the progress of jobs with me.
- 55. CE responds quickly to work status inquiries.
- 56. Upon completion of a job, someone in CE explains the problem to me and what was done to solve it.
- 57. CE provides a reasonable estimate of when work will begin at the time work request is submitted.

NOTE: If you do not live in base housing, please skip question no. 58 and go on to Part IV.

- 58. CE involves you in decisions and planning for maintenance and repair of your home.

#### PART IV - CUSTOMER RESPONSE EXPECTATIONS

Based on each of the following situations below, please indicate how quickly a repairman should be expected to respond. Then indicate how quickly you think civil engineering on your base would respond. Use the rating scale below when considering each item, and fill in the appropriate circle on the answer form provided.

- 1 - WITHIN FOUR HOURS
- 2 - WITHIN ONE DAY
- 3 - WITHIN TWO DAYS
- 4 - WITHIN ONE WEEK
- 5 - WITHIN ONE MONTH
- 6 - WITHIN SIX MONTHS
- 7 - MORE THAN SIX MONTHS
- 8 - WOULD NOT HIRE CRAFTSMAN, WOULD FIX MYSELF
- 9 - DON'T KNOW

The roof of your home is leaking in two places at a rate of one gallon an hour.

59. What is a reasonable response time from a repairman?

60. How long would civil engineering take to respond?

Your bathroom faucet has a leaky faucet.

61. What is a reasonable response time from a repairman?

62. How long would civil engineering take to respond?

A window pane in your living room is broken accidentally in the middle of winter.

63. What is a reasonable response time from a repairman?

64. How long would civil engineering take to respond?

Your office building's heater breaks down in the middle of winter.

65. What is a reasonable response time from a repairman?

66. How long would civil engineering take to respond?

Your home's air conditioner breaks down in the middle of summer.

67. What is a reasonable response time from a repairman?

68. How long would civil engineering take to respond?

- 1 - WITHIN FOUR HOURS
- 2 - WITHIN ONE DAY
- 3 - WITHIN TWO DAYS
- 4 - WITHIN ONE WEEK
- 5 - WITHIN ONE MONTH
- 6 - WITHIN SIX MONTHS
- 7 - MORE THAN SIX MONTHS
- 8 - WOULD NOT HIRE CRAFTSMAN, WOULD FIX MYSELF
- 9 - DON'T KNOW

You decide your office area needs to be renovated to improve working conditions.

69. What is a reasonable response time from a repairman?

70. How long would civil engineering take to respond?

One of four toilets in the office restroom becomes stopped up.

71. What is a reasonable response time from a repairman?

72. How long would civil engineering take to respond?

The power goes out during an electric storm in mid-summer.

73. What is a reasonable response time from a repairman?

74. How long would civil engineering take to respond?

An ice storm knocks out your power in mid-January.

75. What is a reasonable response time from a repairman?

76. How long would civil engineering take to respond?

The paint on your house is flaking off.

77. What is a reasonable response time from a repairman?

78. How long would civil engineering take to respond?

The faucets in your office work but look corroded and grungy.

79. What is a reasonable response time from a repairman?

80. How long would civil engineering take to respond?

PART V - OPEN-ENDED QUESTIONS

81. Please use the space below to identify anything you particularly like or dislike about the way your base's civil engineering squadron supports the base.

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82. Please use the space below to identify anything you particularly like or dislike about the quality or condition of facilities on your base.

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THANK YOU VERY MUCH FOR YOUR TIME AND ASSISTANCE!

## Appendix B: Models with Factor Loadings

### Four Factor Model Based on Kirschbaum Model

The first factor analysis included only the questions in Kirschbaum's model. This model used principal component analysis and promax rotation. Promax rotation assumes interdependence among the factors and oblique axes. Below are the questions that loaded on each factor and their factor loadings. The SAS statistical software program identified all factor loadings greater than 0.3442. The actual factor loadings have been multiplied by 100 and rounded to the nearest integer value.

<u>FACTOR 1</u>	<u>FACTOR LOADING</u>
35. Be prepared on first visit to job	92
39. Get the job done right the first time	83
33. Keep workers productive in facilities	80
23. Complete jobs quickly	78
34. Plan and schedule jobs quickly	72
32. Allow more schedule flexibility	65
31. Maintain a sense of urgency	61
40. Empathize with problem	54
18. Quick response to complaints	52
42. Eliminate "It's not my job!" attitude	50
49. Make sure finished jobs are attractive	48
38. Offer reasonable explanations	43
 <u>FACTOR 2</u>	
22. Make shop foreman available	86
21. Provide information on CE organization	57
27. Personal attention to complaints	55
20. Explain job before starting	53
28. Notification before starting jobs	53
53. Treat complaints as priorities	35
 <u>FACTOR 3</u>	
41. Periodic listings of jobs and status	86
54. Updates on work as it progresses	52
56. Discuss finished jobs	51
46. Simplify procedures for complaints	45
43. Follow-up on finished jobs	42
51. Notification and explanation of delays	39
57. Reasonable work start estimates	36

FACTOR 4

25. Courteous, helpful attitude (Cust Svc)	87
44. Courteous, helpful attitude (Craftsmen)	60
26. Established single point-of-contact	56
55. Quick response to work status inquiries	35

DOESN'T LOAD

52. Listen to my problem

### Three Factor Model based on Kirschbaum Model

The next factor analysis again used only the questions from the Kirschbaum model. However, this time the number of factors was set at three since only three factors had eigenvalues greater than 1.0 prior to rotation. This model used principal component analysis and promax rotation. Promax rotation assumes interdependence among the factors and oblique axes. Below are the questions that loaded on each factor and their factor loadings. The SAS statistical software program identified all factor loadings greater than 0.3941. The actual factor loadings have been multiplied by 100 and rounded to the nearest integer value.

<u>FACTOR 1</u>	<u>FACTOR LOADING</u>
35. Be prepared on first visit to job	91
39. Get the job done right the first time	82
33. Keep workers productive in facilities	78
23. Complete jobs quickly	77
34. Plan and schedule jobs quickly	71
32. Allow more schedule flexibility	65
31. Maintain a sense of urgency	61
40. Empathize with problem	54
18. Quick response to complaints	51
42. Eliminate "It's not my job!" attitude	50
49. Make sure finished jobs are attractive	48
38. Offer reasonable explanations	43
 <u>FACTOR 2</u>	
41. Periodic listings of jobs and status	79
22. Make shop foreman available	68
51. Notification and explanation of delays	68
56. Discuss finished jobs	64
57. Reasonable work start estimates	64
54. Updates on work as it progresses	63
28. Notification before starting jobs	57
21. Provide information on CE organization	55
43. Follow-up on finished jobs	50
20. Explain job before starting	50
46. Simplify procedures for complaints	46
52. Listen to my problem	44
53. Treat complaints as priorities	42

FACTOR 3

25. Courteous, helpful attitude (Cust Svc)	90
26. Established single point-of-contact	66
44. Courteous, helpful attitude (Craftsmen)	56
27. Personal attention to complaints	43

DOESN'T LOAD

55. Quick response to work status inquiries

### Eight Factor Model Using All Questions

The next factor analysis started from scratch and included all questions 6 through 58. This time, the number of factors was set at eight since eight factors had eigenvalues greater than 1.0 prior to rotation. This model used principal component analysis and promax rotation. Promax rotation assumes interdependence among the factors and oblique axes. Below are the questions that loaded on each factor and their factor loadings. The SAS statistical software program identified all factor loadings greater than 0.2541. The actual factor loadings have been multiplied by 100 and rounded to the nearest integer value.

<u>FACTOR 1: CUSTOMER ORIENTED COMMUNICATIONS</u>	<u>FACTOR LOADING</u>
57. Reasonable work start estimates	86
51. Notification and explanation of delays	84
56. Discuss finished jobs	78
41. Periodic listings of jobs and status	77
28. Notification before starting jobs	77
54. Updates on work as it progresses	77
36. Explain policies and procedures	75
43. Follow-up on finished jobs	71
22. Make shop foremen available	63
20. Explain job before starting	62
53. Treat complaints as priorities	59
21. Provide information on CE organization	56
34. Plan and schedule jobs quickly	54
52. Listen to my problem	53
46. Simplify procedures for complaints	51
42. Eliminated "It's not my job!" attitude	49
32. Allow more schedule flexibility	48
48. Small jobs given priority	46
30. Involve facility user in decisions	44
49. Make sure finished jobs are attractive	44
40. Empathize with problem	43
38. Offer reasonable explanations	43
<u>FACTOR 2: FACILITY QUALITY</u>	
6. Impact of facility condition on organization morale	91
13. Condition of building you work in	90
10. Your facility as compared to the private sector	84
12. Impact organization's facilities have on mission	76
7. How buildings on base are maintained	47

### FACTOR 3: RESPONSIVENESS

23. Complete jobs quickly	65
24. Overall CE support of the base	64
18. Quick response to complaints	63
50. Overall base maintenance and repair	54
31. Maintain a sense of urgency	51
35. Be prepared on first visit to job	49
39. Get the job done right the first time	49
55. Quick response to work status inquiries	33

### FACTOR 4: CUSTOMER SERVICE SECTION

25. Courteous, helpful attitude (Cust Svc)	63
26. Established single point-of-contact	57
29. Assist in completing paperwork	55
19. Simplified paperwork and coordination	51
27. Personal attention to complaints	42
45. Focus on work required, not paperwork	34

### FACTOR 5: CIVIL ENGINEERING IMAGE

44. Courteous, helpful attitude (craftsmen)	71
37. Maintain a presentable image	69
47. Keep disruptions to a minimum	60
33. Keep workers productive in facilities	38

### FACTOR 6: BASE APPEARANCE

9. How grounds on base are maintained	84
11. Base grounds are attractively landscaped	83
14. Overall quality of facilities on base	43

### FACTOR 7: MILITARY FAMILY HOUSING

16. Condition of family housing	86
17. Base housing comparable to off-base on your salary	82
58. Involve resident in decisions of home	64

### FACTOR 8: QUALITY OF AIR FORCE LIFE

8. Quality of life offered by Air Force career	89
15. Quality of life in Air Force as compared to private sector	67

### Final Six Factor Model

The final factor analysis was based on the eight factor model with factor 7 (questions 16, 17, and 58), factor 8 (questions 8 and 15), and questions 7, 14, 24, and 50 deleted. The logic for deleting these factors and questions has been presented in Chapter IV. This time, the number of factors was set at six since six factors had eigenvalues greater than 1.0 prior to rotation. This model used principal component analysis and promax rotation. Promax rotation assumes interdependence among the factors and oblique axes. Below are the questions that loaded on each factor and their factor loadings. The SAS statistical software program identified all factor loadings greater than 0.2844. The actual factor loadings have been multiplied by 100 and rounded to the nearest integer value.

<u>FACTOR 1: CUSTOMER ORIENTED COMMUNICATION</u>	<u>FACTOR LOADING</u>
41. Periodic listings of jobs and status	81
56. Discuss finished jobs	71
54. Updates on work as it progresses	69
51. Notification and explanation of delays.	68
57. Reasonable work start estimates	65
22. Make shop foremen available	61
28. Notification before starting work	59
43. Follow-up on finished jobs	54
21. Provide information on CE organization	51
36. Explain policies and procedures	51
20. Explain job before starting	49
46. Simplify procedures for complaints	45
52. Listen to my problem	45
53. Treat complaints as priorities	41
48. Small jobs are given priority	37
<u>FACTOR 2: RESPONSIVENESS</u>	
35. Be prepared on first visit to job	84
23. Complete jobs quickly	76
39. Get the job done right the first time	71
34. Plan and schedule jobs quickly	70
32. Allow more schedule flexibility	64
31. Maintain a sense of urgency	63
33. Keep workers productive in facilities	60
18. Quick response to complaints	57
40. Empathize with problem	51
42. Eliminate "It's not my job!" attitude	48
38. Offer reasonable explanations	43

### FACTOR 3: CUSTOMER SERVICE SECTION

25. Courteous, helpful attitude (Cust Svc)	67
26. Established single point-of-contact	67
29. Provide assistance with paperwork	62
19. Simplify paperwork and coordination	61
27. Personal attention to complaints	52
30. Involves facility user in decisions	40
45. Focus on work, not accuracy of paperwork	38
55. Quick response to work status inquiries	29

### FACTOR 4: FACILITY QUALITY

6. Impact of facility condition on morale	87
13. Condition of your building	87
10. Your facility compared to equivalent in private sector	82
12. Impact of facilities on mission	77

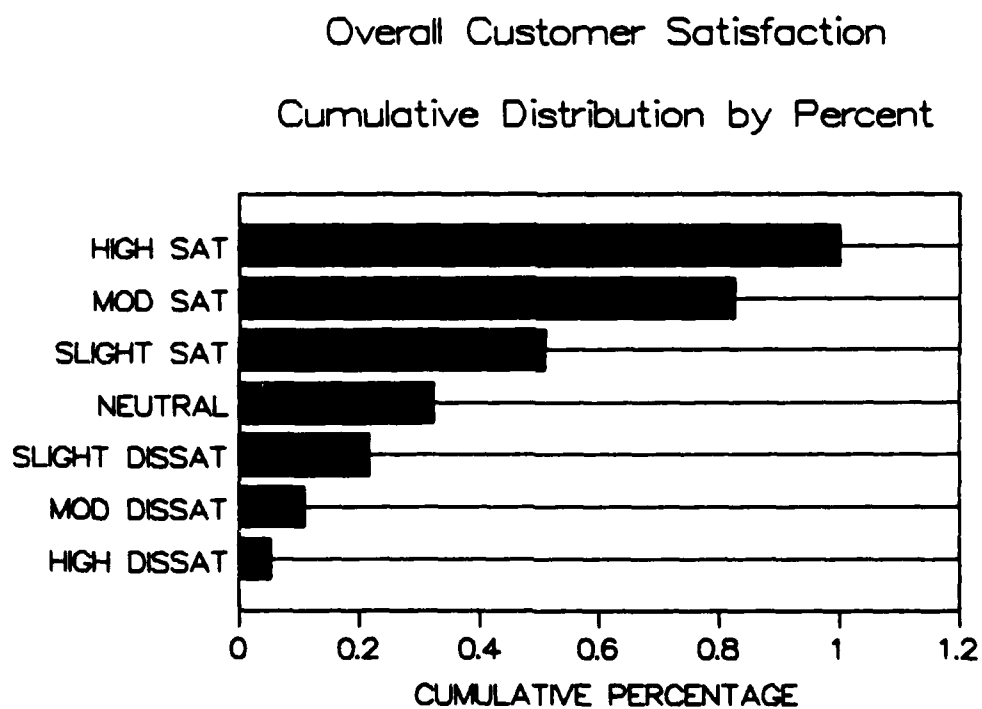
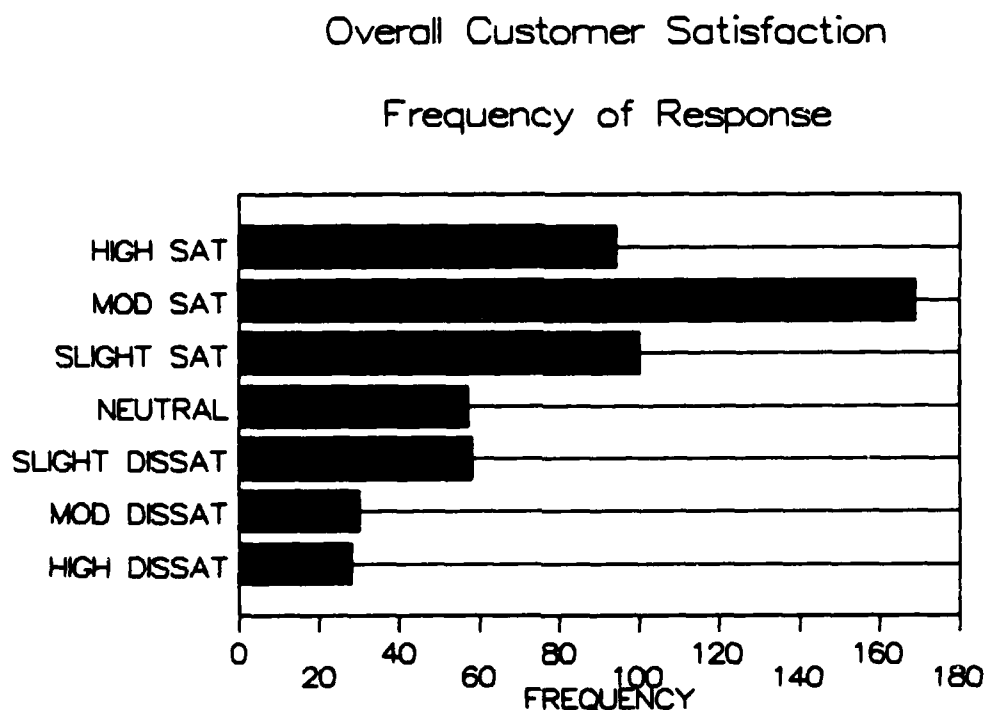
### FACTOR 5: CIVIL ENGINEERING IMAGE

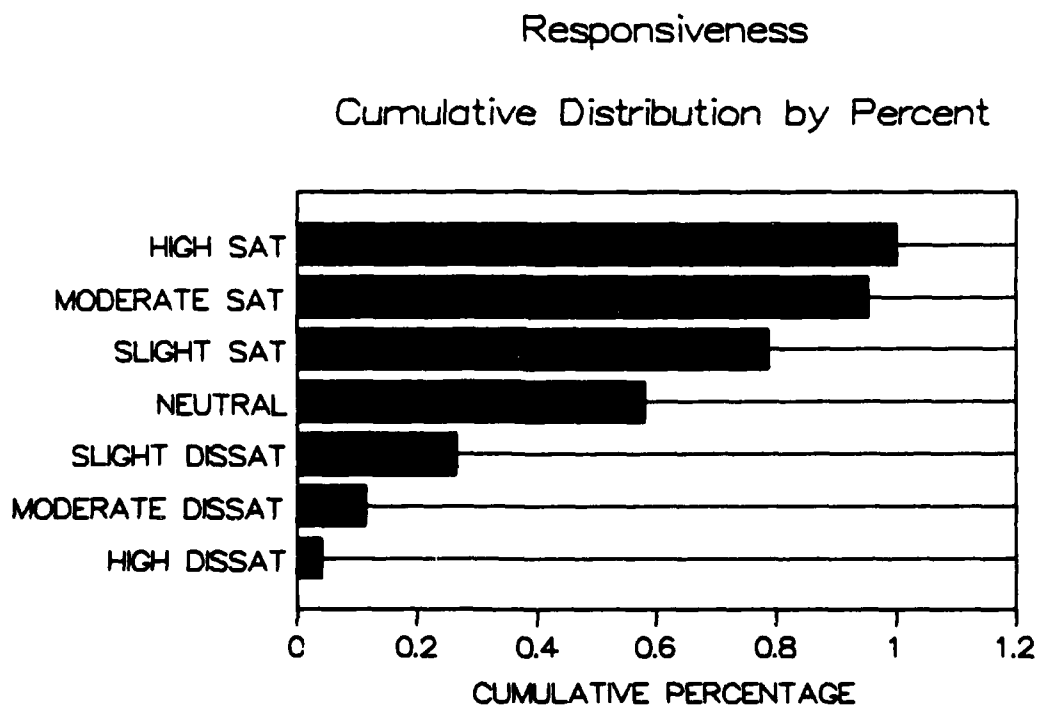
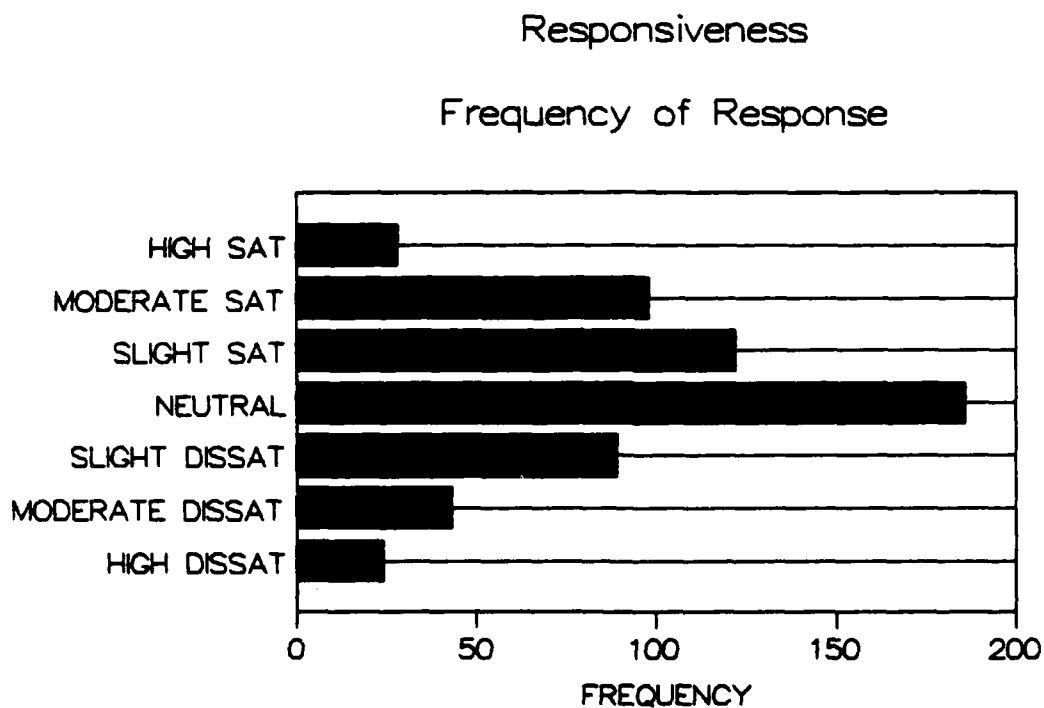
44. Courteous, helpful attitude (Craftsmen)	72
47. Keep disruptions to a minimum	65
37. Maintain a presentable image	63
49. Make sure finished jobs are attractive	40

### FACTOR 6: GROUNDS APPEARANCE

9. Grounds maintenance on base	85
11. Base grounds are attractively landscaped	83

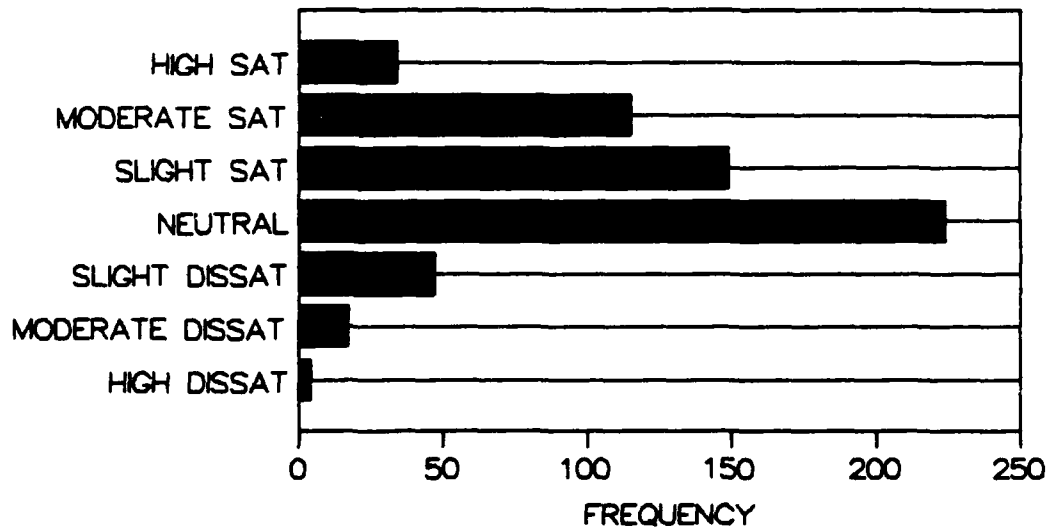
Appendix C: Bar Charts of Response  
Frequency for Customer Satisfaction and Factors





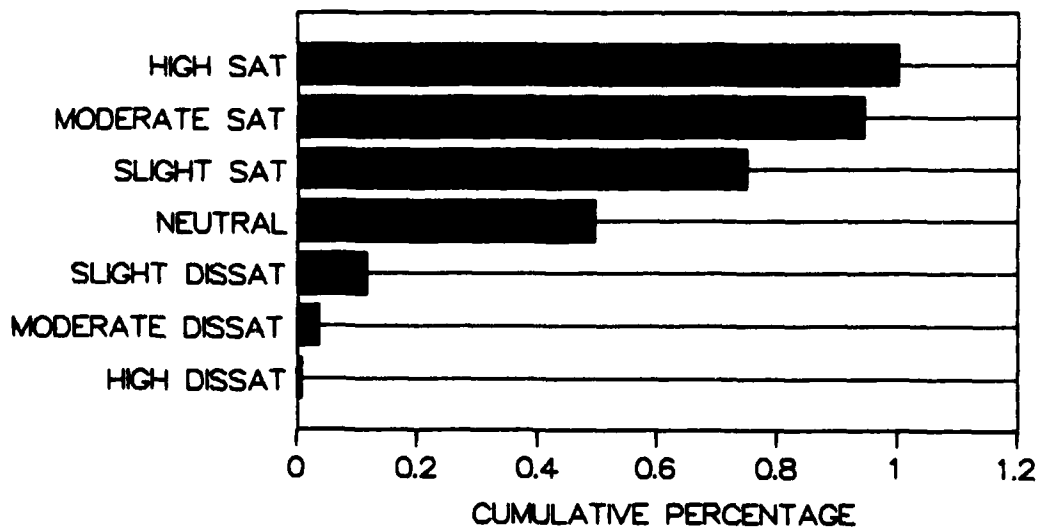
# Customer Service Section

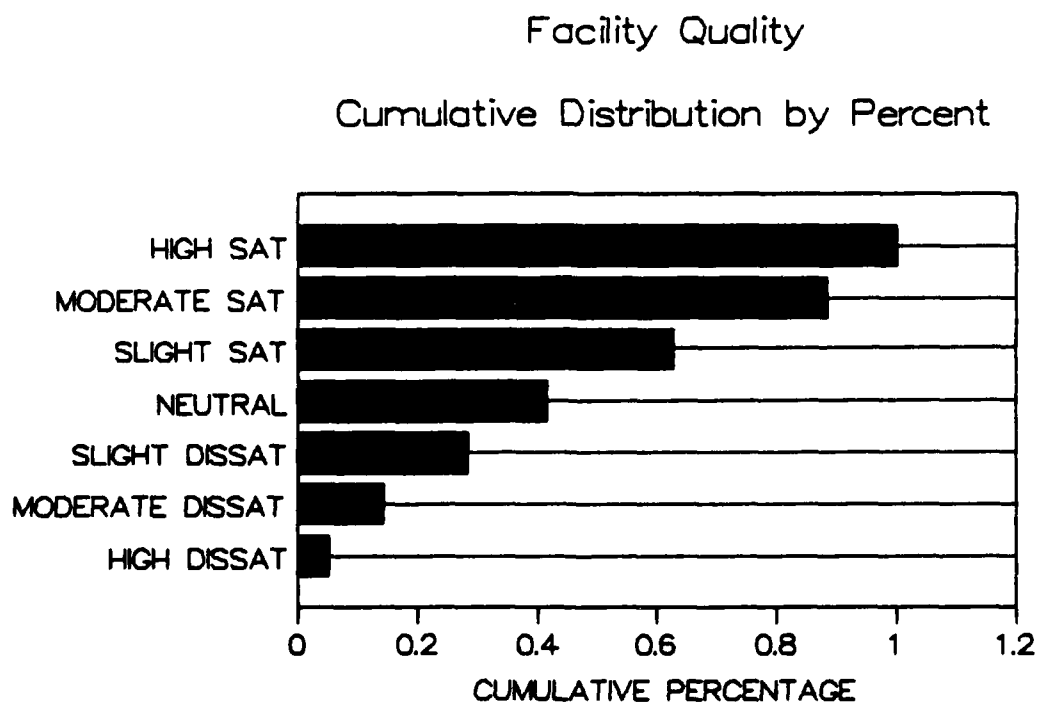
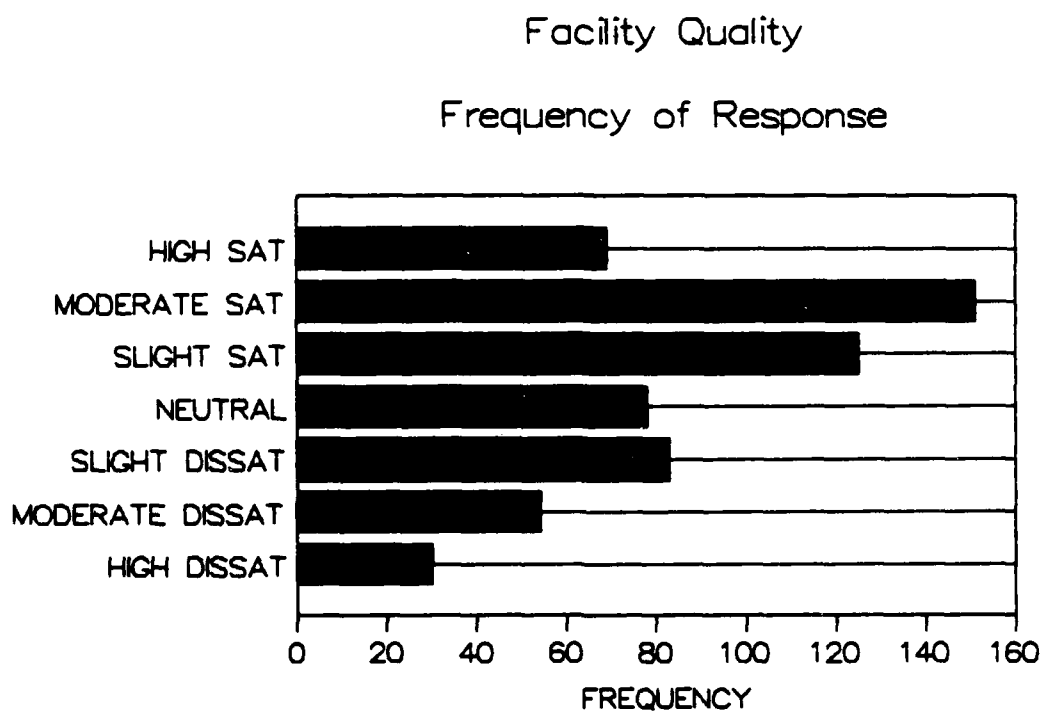
## Frequency of Response

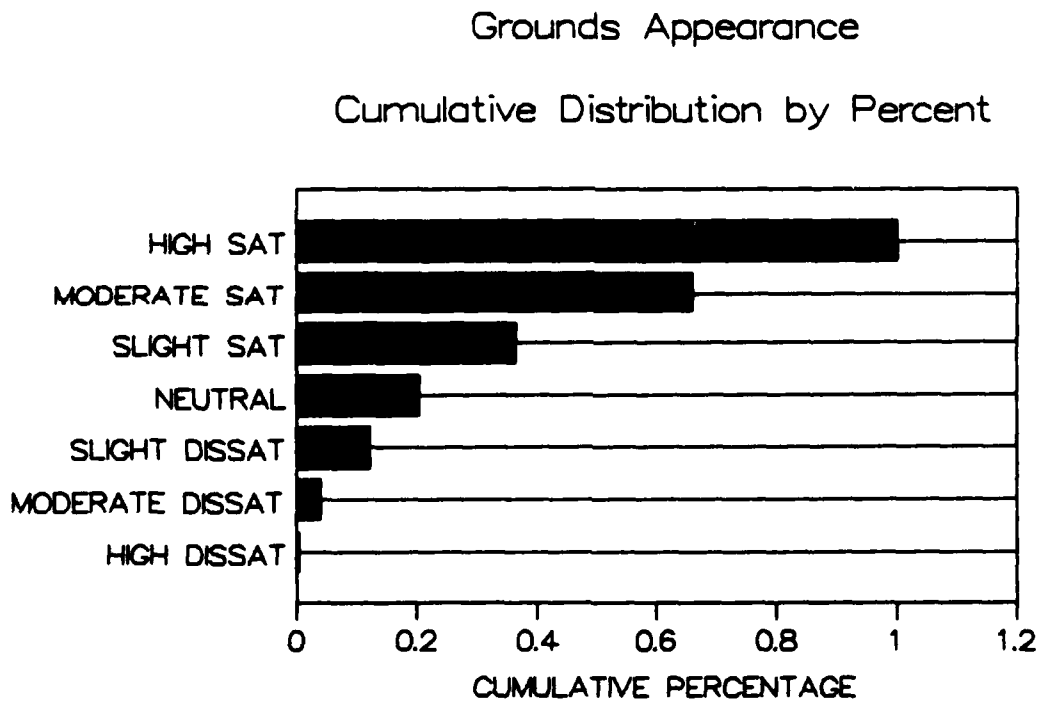
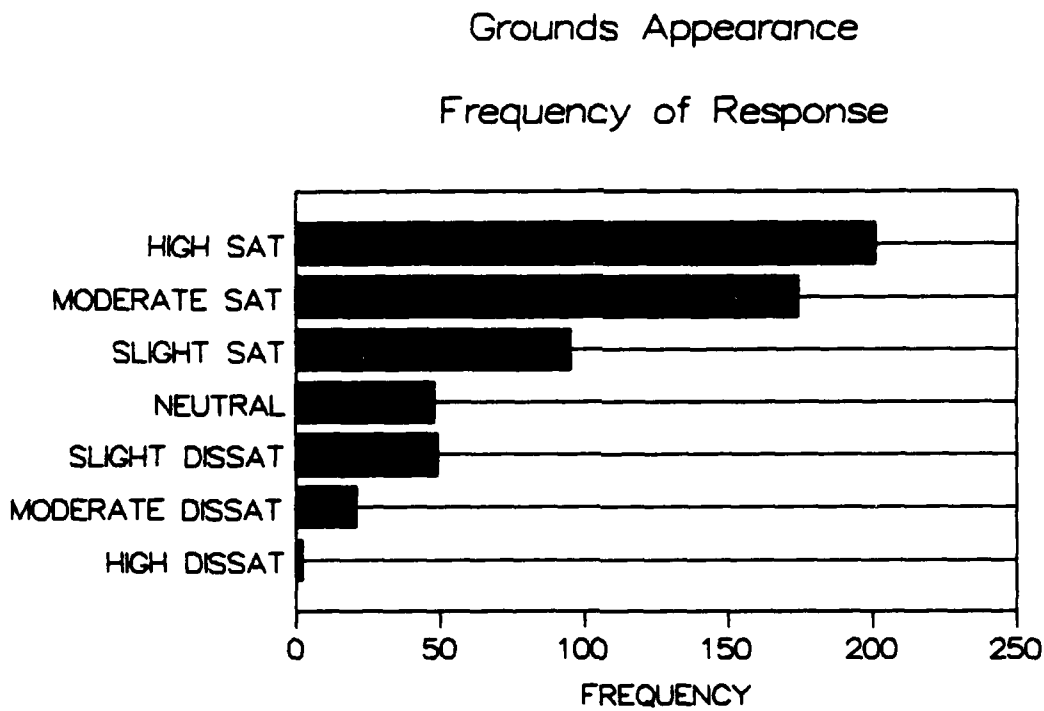


# Customer Service Section

## Cumulative Distribution by Percent

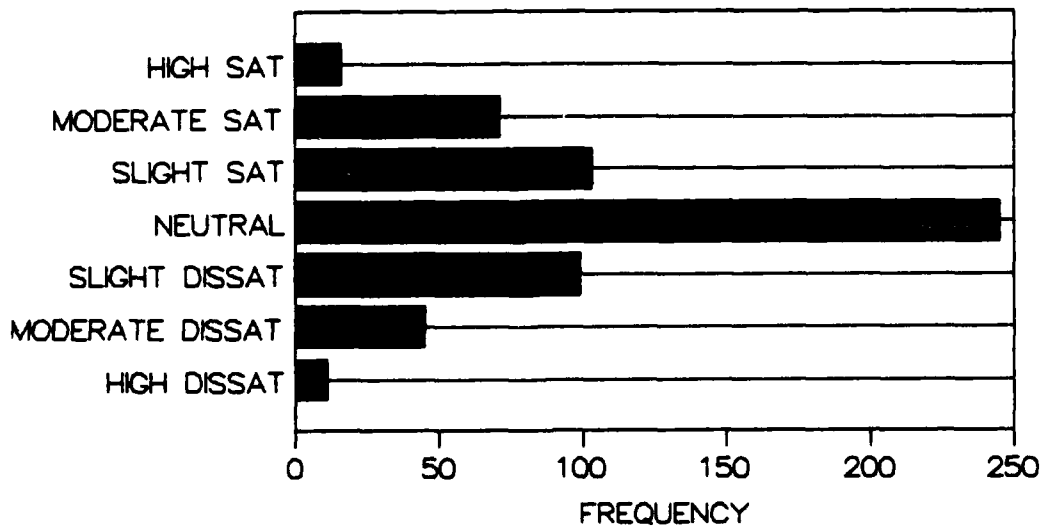






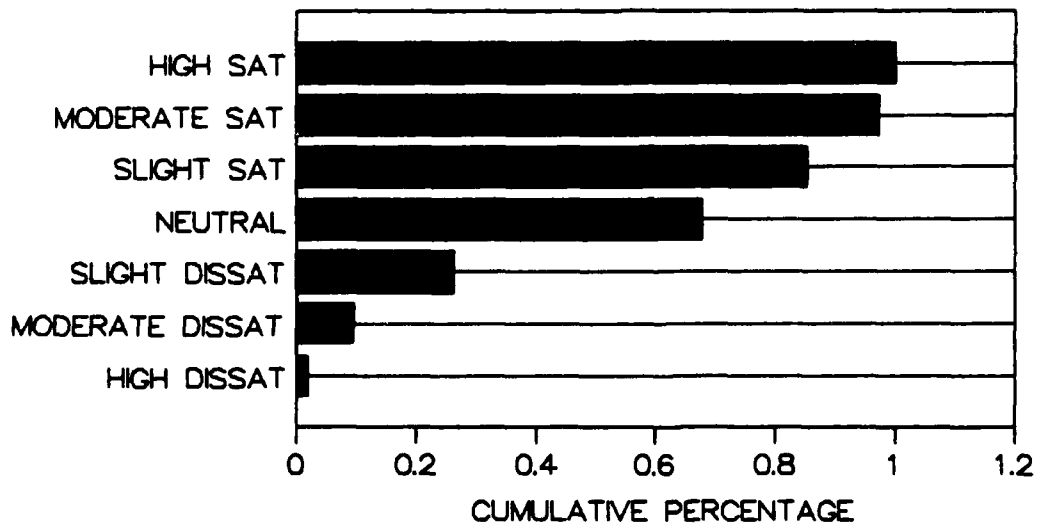
## Customer Oriented Communications

### Frequency of Response



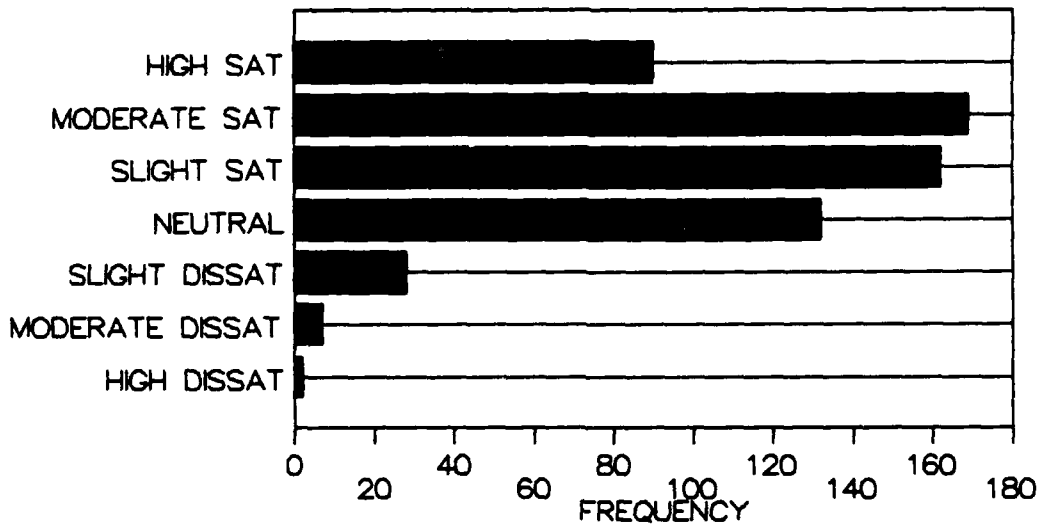
## Customer Oriented Communication

### Cumulative Distribution by Percent



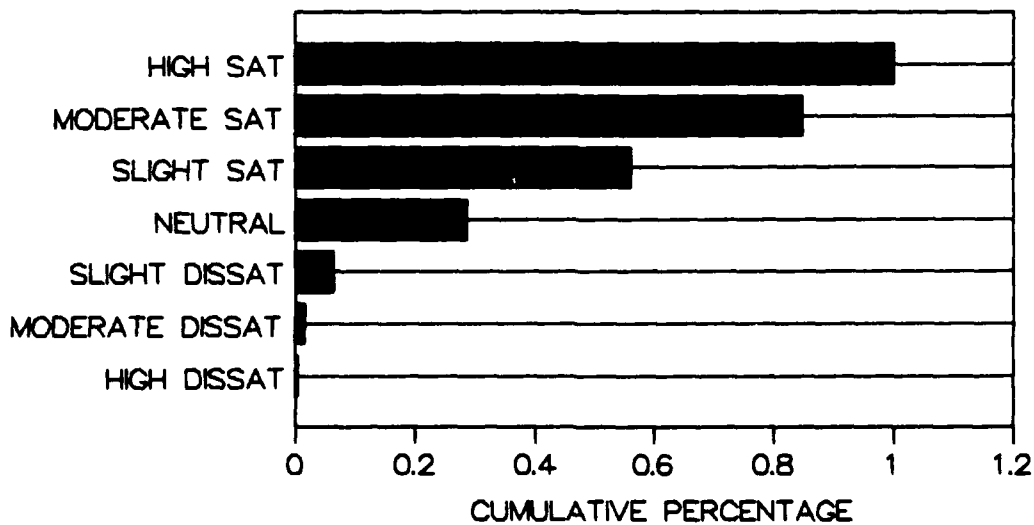
## Civil Engineering Image

### Frequency of Response



## Civil Engineering Image

### Cumulative Distribution by Percent



### Appendix D: Survey Results

#### PARTS II & III - CUSTOMER SATISFACTION RESPONSES

Question	Frequency of Responses						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
6. Impact of facility condition on organization morale	44	62	71	38	78	193	95
7. How buildings on base are maintained	19	51	64	27	90	230	105
8. Quality of life offered by Air Force Career	11	19	50	47	72	210	173
9. How grounds on base are maintained	5	25	55	31	71	186	215
10. Your facility as compared to the private sector	83	72	96	30	70	142	87
11. Grounds on base are attractively landscaped	9	21	46	54	91	182	185
12. Impact organization's facilities have on mission	21	42	70	77	86	169	113
13. Condition of building you work in	55	65	98	16	86	159	106
14. Overall quality of facilities on base	11	28	49	44	119	238	95
15. Quality of life in Air Force as compared to private sector	23	46	90	76	109	156	70
16. Condition of family housing	19	20	23	13	31	46	29
17. Base housing comparable to off-base on your salary	17	19	28	18	28	34	38
18. Speed of response to complaints	31	34	67	33	86	160	117
19. Simplified paperwork and coordination	38	43	58	67	94	86	66

#### Scale For Satisfaction Responses

- |                             |                          |
|-----------------------------|--------------------------|
| 1 - Highly Dissatisfied     | 5 - Slightly Satisfied   |
| 2 - Moderately Dissatisfied | 6 - Moderately Satisfied |
| 3 - Slightly Dissatisfied   | 7 - Highly Satisfied     |
| 4 - Neutral                 |                          |

Question	Frequency of Responses						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
20. Explain job prior to start	39	50	73	88	74	98	53
21. Provide information on CE organization	34	51	91	112	84	89	43
22. Let customers deal with shop foremen about complaints	39	39	44	88	59	74	45
23. Jobs are completed quickly	49	48	77	46	99	129	85
24. Overall CE support of the base	28	30	58	57	100	169	94
25. Customer service reps are courteous and helpful	8	12	39	52	91	149	148
26. Single point-of-contact has been provided	17	24	33	60	53	111	112
27. Complaints receive personal attention	32	22	61	80	57	85	64
28. Notification before starting jobs	53	52	81	57	97	96	56
29. Assist in completing paperwork	16	20	61	70	90	86	85
30. Involve facility user in decisions	39	48	53	59	90	115	71
31. Maintain sense of urgency	42	58	90	65	110	104	52
32. Allow schedule flexibility	51	55	88	59	79	87	48
33. Keep workers productive in facilities	34	43	59	72	83	126	86
34. Plan and schedule jobs quickly	77	67	94	58	78	80	32
35. Be prepared on first visit to job	56	65	99	59	82	109	37
36. Explain policies and procedures	46	51	90	84	79	69	38
37. Maintain presentable image	10	20	45	71	118	165	123
38. Offer reasonable explanations	21	39	74	80	93	112	54

#### Scale For Satisfaction Responses

- |                             |                          |
|-----------------------------|--------------------------|
| 1 - Highly Dissatisfied     | 5 - Slightly Satisfied   |
| 2 - Moderately Dissatisfied | 6 - Moderately Satisfied |
| 3 - Slightly Dissatisfied   | 7 - Highly Satisfied     |
| 4 - Neutral                 |                          |

Question	Frequency of Responses						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
39. Get the job done right the first time	52	52	87	56	103	117	56
40. Empathize with problem	39	48	99	75	94	105	49
41. Periodic listings of jobs and status	86	33	40	68	47	58	53
42. Eliminate "It's not my job!" attitude	55	60	81	73	88	72	49
43. Follow-up on finished jobs	60	59	83	72	86	76	43
44. Courteous, helpful attitude (Craftsmen)	7	10	28	57	133	166	130
45. Focus on work required, not paperwork	17	24	56	89	79	106	74
46. Simplify procedures for complaints	25	25	44	80	79	86	60
47. Keep disruptions to minimum	9	14	26	59	103	177	152
48. Small jobs given priority	38	26	72	93	81	70	34
49. Make sure finished jobs are attractive	30	36	73	64	104	136	86
50. Overall base maintenance and repair	21	29	60	48	121	172	92
51. Notification and explanation of delays	63	57	95	60	67	84	48
52. Listen to my problem	21	28	80	80	96	111	69
53. Treat complaints as priorities	30	26	66	94	61	62	55
54. Updates on work as it progresses	26	42	95	89	71	74	65
55. Quick response to work status inquiries	28	37	62	63	96	114	73
56. Discuss finished jobs	45	41	75	75	86	82	61
57. Reasonable work start estimate	86	66	82	59	74	68	37
58. Involve resident in decisions on home	35	22	26	25	18	23	18

Scale For Satisfaction Responses

- |                             |                          |
|-----------------------------|--------------------------|
| 1 - Highly Dissatisfied     | 5 - Slightly Satisfied   |
| 2 - Moderately Dissatisfied | 6 - Moderately Satisfied |
| 3 - Slightly Dissatisfied   | 7 - Highly Satisfied     |
| 4 - Neutral                 |                          |

# PART IV - CUSTOMER RESPONSE EXPECTATIONS

Scenario	Frequency of Responses							
	Reasonable Response							
	Perceived CE Response	(1)	(2)	(3)	(4)	(5)	(6)	(7) (8)

The roof of your home is leaking in two places at a rate of one gallon an hour.

59. Reasonable response	340	137	27	18	5	3	0	23
60. Perceived CE response	109	154	80	73	23	9	4	29

Your bathroom faucet has a leaky faucet.

61. Reasonable response	36	119	130	156	26	3	0	82
62. Perceived CE response	32	88	91	156	65	10	2	42

A window pane in your living room is broken accidentally in the middle of winter.

63. Reasonable response	205	205	64	22	2	0	1	51
64. Perceived CE response	85	160	89	73	19	2	1	29

Your office building's heater breaks down in the middle of winter.

65. Reasonable response	292	209	33	15	2	0	1	7
66. Perceived CE response	138	177	89	60	9	5	1	20

Your home's air conditioner breaks down in the middle of summer.

67. Reasonable response	81	245	134	57	8	2	0	10
68. Perceived CE response	29	135	110	118	27	10	5	24

## Responsiveness Scale

- |                       |   |
|-----------------------|---|
| 1 - Within Four Hours | 5 - Within One Month                              |
| 2 - Within One Day    | 6 - Within Six Months                             |
| 3 - Within Two Days   | 7 - More Than Six Months                          |
| 4 - Within One Week   | 8 - Would Not Hire Craftsman,<br>Would Fix Myself |

Scenario	Frequency of Responses							
Reasonable Response	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived CE Response								

You decide your office area needs to be renovated to improve working conditions.

69. Reasonable response	8	15	15	107	170	154	27	44
70. Perceived CE response	7	12	9	38	63	128	169	39

One of four toilets in the office restroom becomes stopped up.

71. Reasonable response	106	223	103	92	16	2	1	24
72. Perceived CE response	69	147	101	114	39	5	7	25

The power goes out during an electric storm in mid-summer.

73. Reasonable response	370	159	15	3	1	3	0	10
74. Perceived CE response	260	182	25	13	5	0	1	17

An ice storm knocks out your power in mid-January.

75. Reasonable response	362	159	17	7	1	4	0	10
76. Perceived CE response	237	184	30	14	4	10	2	17

The paint on your house is flaking off.

77. Reasonable response	6	15	21	102	177	130	29	65
78. Perceived CE response	3	6	7	38	95	136	138	35

#### Responsiveness Scale

- |                       |   |
|-----------------------|---|
| 1 - Within Four Hours | 5 - Within One Month                              |
| 2 - Within One Day    | 6 - Within Six Months                             |
| 3 - Within Two Days   | 7 - More Than Six Months                          |
| 4 - Within One Week   | 8 - Would Not Hire Craftsman,<br>Would Fix Myself |

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Scenario	Frequency of Responses							
Reasonable Response	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Perceived CE Response								

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The faucets in your office work but look corroded and grungy.

79. Reasonable response	13	27	27	122	160	112	33	56
80. Perceived CE response	5	10	12	60	117	112	105	41

---

Responsiveness Scale

- |                       |   |
|-----------------------|---|
| 1 - Within Four Hours | 5 - Within One Month                              |
| 2 - Within One Day    | 6 - Within Six Months                             |
| 3 - Within Two Days   | 7 - More Than Six Months                          |
| 4 - Within One Week   | 8 - Would Not Hire Craftsman,<br>Would Fix Myself |

#### Appendix E: Responses to Open-ended Questions

The responses to open-ended questions 81 and 82 are presented by respondent category. The observation numbers do not identify respondents; they were intended to allow future researchers to compare an individual's open-ended responses to his other responses in the data base.

An appendix containing 66 pages of open-ended comments may seem ludicrous to some. Yet, these comments were self-initiated by civil engineering customers who felt they had something to say. A central theme in improving customer satisfaction and support is the need to know the customer and his perceptions intimately. There are very few places that a civil engineering officer can find as complete a collection of customer comments as is presented here, and these comments cover the full range of customer attitudes.

It is important to note that this is not a random sample. The individuals that responded to these questions were self-selected. It is reasonable to expect that some bias was introduced. On the other hand, these individuals felt strongly enough to voice their opinions. There are lessons here for any civil engineering manager motivated to improve the way civil engineering conducts its business.

### Field Grade Officers

#### Observation #5

- 81. Generally good support. Courteous treatment by customer service. Sometimes slow response on some repairs.
- 82. Good facilities. Good attempt to satisfy base community.

#### Observation #6

- 81. They spend too much effort on senior officers' homes!
- 82. They're O.K. Need new buildings.

#### Observation #9

- 81. - Dislike - There is very little preventative maintenance.  
- Like - Response time to questions and emergency problems.

I have only a short time on base. I have not had much of a working relationship with CE.

- 82. Lot of support for self-help. Many facilities improved through self-help.

#### Observation #10

- 81. I've had little to no personal contact with base CE.
- 82. For the amount of money TAC has spent to upgrade the facilities on the base in the last 3 years, it better look good! The golf course is in great shape but my office is in a converted warehouse with poor ventilation and partitions separating offices that provide little privacy or quiet- obviously not CE's problem, but a personal gripe.

#### Observation #11

- 81. C.E. (Housing Maintenance) responds quickly to requests providing they are not snowed other (sic) with similar requests.
- 82. We have been waiting over 6 months for a new water fountain. Still no response.

Observation #12

- 81. In my 25 year career I have never known CE to be any different. The Wing's Command Section and Command Post get renovated unnecessarily while I can't get paint for self-help renovation.
- 82. Base is probably saddled with new poorly designed buildings and old rundown buildings and is doing as might be expected.

Observation #15

- 81. Contract family housing maintenance works well - responsive, courteous, relatively quick - much better response than I expect in private house!
- 82. Lack of basements (Californian earthquake requirements) really cramps storage space - should be taken into account in allowable size of base houses.

Observation #18

- 81. I like the fact that trees are being planted & the grounds are landscaped.
- 82. I don't like the fact that vast expanses of poor quality grass is watered constantly. That is very wasteful.

Observation #19

- 81. I haven't had any real dealings with CE yet as I just moved into base quarters this past month. I would hope they would be responsive. The base facilities seem to be well kept so it appears that CE people are doing a good job.
- 82. No problems with anything at this time.

Observation #20

- 81. Dislike - Too many "nice to have" base commander generated priorities.
- 82. Like - Well taken care of considering their age.

Observation #22

81. I am in a systems furniture work area designed by CE which is to cramped and is not in real compliance with fire marshal's plans.

Observation #24

81. The external appearance of the base is good. However, we are a tenant organization on the base, and it seems that repairs and upgrades in our building get low priority.

Observation #28

81. A very hard demanding job - but they do it very well.
82. The renovations and upgrades are super! Wish the money would be available to do more.

Observation #30

81. Except for usual budgetary constraints, CE support appears adequate enough. Problems appear to arise when services are contracted out. I have not ever lived on-base so contact with CE is limited.
82. Old but adequate. Again abuses seem to arise more when dealing with contractors.

Observation #34

81. Do not deal with CE squadron.

Observation #37

81. Dislike - CE is so far behind the power curve they go from one crisis to another. They're trying to "automate" now. Don't think that will help. Customer service can tell me if a project is in "planning", "engineering", etc., but can't give any specifics - How long? What's next? Programs get lost between shops. Have work around CE bureaucracy to get anything done.
82. 40 year old facilities - no real money to properly fix/replace. Work contracted out to lowest bidder. System is almost useless.

Observation #38

81. - Seems like there is a lack of proper prioritization of workload. A full colonel needs to request the immediate needs for quick response.
82. Facilities are deteriorating due to lack of funds - not civil engineering! At times, I am ashamed of conditions of facilities. An example is no funds to fix roof for last several years -- despite ceiling collapsing during recent storm.

Observation #39

81. Communications & Planning within CE are very limited. "Its not my job" attitude within CE is prevalent. The organization structure perpetuates this attitude. Although CE is responsible for (ref yr cover letter)-The base population is held accountable. But are not part of the decision making proces. Because of the very limited communication and the dichotomy of responsibility of the facilities etc. CE is not efficient and directly effects retention within the squadrons and throughout the base. "It's good enough for government work" attitude is no longer acceptable under this period of severe defense funding oversight. We need to improve the management of our critical defense installations with better communications, individual building/facility sponsors (liaison officers) within CE that track the progress of maintenance, repair, or replacement of facilities.

Observation #40

81. The completed work looks good and is done right. It just takes them forever to do it. There has been, in my experience, no attempt ever made by CE to keep me informed on the status of the work, or an estimated completion date, or the reason for delay. This is the most frustrating part of all: continually calling the customer service desk or shop foreman for information.
82. Facilities look great; of course, CE has had 60 years to make them so!

Observation #43

81. Response to heating/air conditioning & plumbing is excellent. CE needs to allow base housing residents

to do more self help projects, ie repainting of rooms, repainting outside - all within reason.

82. Hurricane Elena (1985) blew gutters off my quarters & blew down a tree in my backyard. To date, these items have not been repaired. I called these in Sept '85.

Observation #48

81. Seems as though our facility manager is always having to request updates on projects. Would be nice if info flowed better without having to be requested.
82. I like the BOQ facilities immensely. What a super first impression is made to newcomers! The "O" Club sucks. It is cold and informal, dark and dank. Yuck!! Bar is bright and open. Perhaps a role reversal is in order there?

Observation #52

81. Our BCE makes effective use of existing resources. Need to make better use of computers. Need to instill quality work attitude in younger workers.
82. Our BCE needs more resources to keep our facilities at minimum structural standards. Paint, roof repairs, wear & tear, maintenance - repair dollars are not sufficient to meet all our needs.

Observation #53

81. Slow service  
Family Housing upkeep poor  
No preventative maintenance in housing  
Base does not enforce rules/standards in housing area  
Loose pets
82. Size of family housing units

Observation #56

81. We contract maintenance.
82. Base housing is very poorly constructed - not much is being done to upgrade!

Observation #63

82. Too crowded working conditions. Need more space.

Observation #74

CE is doing an above average job in both areas. But, this is also HQ SAC so the facilities and certain jobs are handled with more expediency and care than other, more routine jobs. I lived in base housing ten years ago, so my estimates on CE response times to housing questions may be inaccurate.

Observation #75

81. Squadron does an excellent job and is under constant general officer scrutiny.

82. The base is very well maintained; most HQ bases are.

Observation #86

81. Base facilities & grounds look excellent. CE provides effective support.

82. This base has relatively new permanent buildings with much military construction going on. Both the quality and condition are excellent.

Observation #96

81. I personally have never had any MAJOR successes or failures with CE, but almost every experience has been frustrating, tedious and usually a protracted affair. I recognize CE has a tough job, a lot of critics and nowhere near enough money or people to do it all.

82. Dislike the way contracts are written, controlled and monitored for trash pickup, cleanup, and outside yard/grounds work. The people handling them are never close enough to the daily problems to understand or respond to them.

Observation #102

81. 1. "If it works, it's okay" regardless of how it looks.  
2. Craftsmanship is unacceptable.  
3. It takes 2 employees to do the simplest job!

82. 1. Overcrowding exists, hence air conditioning and heating are inadequate.

2. Building interiors need rehabilitation to meet computer, office and environmental needs of 1980's - 90's - are same as 1950's!

Observation #114

82. At Maxwell AFB, the facilities are probably the best I have seen in the AF. The prison population/work force no doubt contributes to CE's work force.

Observation #115

81. -Emphasis on paper work  
-Priority is set by base commander - not need of family  
-Emphasis is on looks good, not beyond exterior  
-Beauty on Maxwell is only skin deep except in areas of high visibility for VIP visitors.  
-Takes forever to get carpet installed, yet base commander's office had it installed immediately - priority is look good, not be good - working conditions in CAP for instance are deplorable.
82. -OLD, OLD, OLD - my base house is fifty+ years old & has many cracks that loose heat in winter & cooling in summer.  
-Paint project 3 years ago is peeling badly - QA still has not caused windows to be cleaned - still full of paint & fingerprints - windows have screens, but windows cannot be opened - which is alright because screens do not fit.  
-Questions 71 & 72 are asinine - no one has 4 toilets in an office restroom on this base.

Observation #121

81. I'm sure that there are many circumstantial reasons for our CE apparent sub-standard performance, but working in the hospital, I almost daily see inadequacies in CE performance.  
Base Housing is maintained by contract MJCE(?).  
They do an excellent job.
82. We are trying to do a 20th century job in a 19th century facility. Except for a few new buildings, this whole base is WWII vintage.

Observation #124

81. -Generally CE does a good job but too much real estate to keep maintained and too many shifting priorities.

-Heart of CE's public image is customer service. If you don't set up a special team to go to the work site and inquire as to the satisfaction of customer you might as well forget image.

Observation #127

- 81. Really good effort to landscape base nicely.
- 82. Restrooms in my building, as well as others around base, frequently have stopped-up urinals/commodos for extended periods of time.

Observation #131

- 81. Am unable to comment on this or any of the previous questions regarding contracts with CE due to the fact that I have been overseas, on special duty (embassy) assignments, from 1980 through 1987. Have not had any dealings with CE since my return to CONUS. I may suggest that this survey could be optimally answered by personnel living on base housing.
- 82. A substantial number of buildings are extremely old and need to be replaced.

Observation #136

- 81. I have very little contact with CE. I don't do any paperwork with them.
- 82. We have real fine facilities - the only thing we could use are a couple regulation size racquetball courts.

Observation #138

- 81. I have very limited contact with base civil engineering as an (illegible) officer. However, their response to problems with our (illegible) officer has been minimally responsive.
- 82. Our office is a secure vault built 1 1/2 years ago. We have had numerous routine warranty fixes required. Base CE contracting people and management appear to be totally incompetent executing and overseeing work and following through after (illegible) occupancy. Also many (illegible) shortcuts were taken during construction which we are now having to reverse via new contracts and work orders. For example: we are in a secure vault - no

windows - the AC is connected to the main building's air conditioning - after the main building's air conditioning is turned off for energy conservation our office has no ventilation or air. We normally have to leave work early or relocate during the summer. Work-order submitted to provide an inadequate AC unit as specified is (illegible) spec. dumb\_\_\_\_\_ in CE allowed original contractor to tie to main buildings AC as a cost-cutting initiative - it will now cost more with an undetermined delay. In my opinion CE contract management is a joke.

Observation #145

82. Overall TAC is great as is this installation. I am assigned to a unit in a very old building. It is in poor condition despite CE & self help. The cockroaches are numerous & huge.

Observation #149

81. I have been satisfied with CE support. I don't really work with CE in my position.
82. Everything looks excellent!

Observation #150

81. I have been here less than 2 weeks; therefore, I cannot accurately assess the performance of this base's civil engineering squadron except to note that they must be primarily responsible for the overall good appearance of the entire base.
82. Base housing seems to be excellently maintained despite its age. So far, I have not seen any facilities that appear in less than excellent condition.

Observation #151

81. During the past 18 years I have lived on-base three times. Generally CE support is excellent and comparable to any outside. I believe we sometimes expect CE to do more for base facilities than we would do for our own homes.
82. AFLC/CE does well with old buildings. We, the Air Force, can not afford new buildings or to expect to rent commercial facilities. Our mission, profession is to serve the security need of the nation, not have expensive offices. Too bad we can't apply the

same standards to industry.

Observation #153

81. Housing maintenance is great.

Observation #164

81. No contact with CE.

82. The entire base (Kirtland) is the worst looking/  
poorest maintained base I've been on in 20 years.  
The roads are "wash boards", the gym is smelly and  
noisy, the outdoor recreation facilities are not  
maintained, the roads are flooded every time it  
rains and the office buildings are, in most cases,  
"bare base".

Observation #168

81. I believe this base's CE does not respond as quickly  
as it should. For example, I reported a leak in the  
roof of my house. One month later it was checked;  
two months later it's still not fixed. Now the  
ceiling is falling in and water is dripping on oak  
floors. Also when problems aren't fixed in a timely  
manner, the writeup date is changed to show a later  
date (makes it appear CE responds in timely manner).

Observation #173

81. Like - Nellis AFB has the BEST Environmental  
Engineer I've seen during my AF career. Mr. Les  
Monroe is an outstanding AF employee. The entire CE  
organization has done a great job at Nellis AFB.
82. Nellis AFB is a model for others to emulate.

Observation #190

81. The new CE grounds maintenance contract seems to be  
working nicely. The base never looked better.
82. Rehabed office building was tremendous improvement  
over our former location (condemned hangar).

Observation #192

82. -Offutt looks terrible.  
-Facilities are zoo-like.  
-Chemical burn fumes permeate buildings.  
-Base cmdrs ignore dangerous situations.

Observation #198

81. As a staff officer, I have little interaction with CE. The base is well maintained - as would be expected at a MAJCOM Headquarters.

Observation #201

82. Base housing for O-6's is far too small. 1300+ sq. ft. doesn't hack it.

Observation #207

81. Appears to be doing a good job.
82. Maxwell AFB is an old installation with a number of old buildings either being renovated or identified for destruction. In spite of this situation, the base and grounds generally look good. Part of this is due to the work provided by 600-700 prisoners from federal prison camp on base. CE personnel supervise the prisoners --I think.

Observation #215

81. Our CE squadron sent personnel on a recent TDY deployment to help in set-up of facilities. They did a great job and were essential to our success.
82. We were named the outstanding USAF base world-wide for 1986. Our CE squadron obviously has done a superb job in improving and maintaining our base facilities.

Observation #224

81. CE does not perform any renovation within reasonable times (less than 1-2 years) to work offices in fighter squadrons. We are expected to do our own "self help" at all times. In fact, our squadron has had to (illegible).
82. CE has one of the best looking buildings on base. Questions???

Observation #225

81. Best Civil Engineering Squadron in the USAF? 347 CES, Moody AFB, GA.
82. Air conditioning and heating is always a problem!

Lighting is poor!

Observation #226

81. Submitting a request to CE for painting of the interior of a facility is a joke. They always suggest "self help." Why should we have to do our own painting?

Observation #227

81. I work in the largest academic building in the world. I think our CE work is quite good. However, I do not understand why lighting requests take so long (replacing bulbs in classes & offices).
82. I have never called for any repair other than a stopped-up toilet and failed bulb. This is why so much is "don't know." I live next door to CE Commander - he answers every question I ask about base CE.

Observation #236

82. The squadron had done a very good job of upkeep, but with funding reductions, the summer hires, etc., have not been utilized for grass cutting, cleanup, etc. This has degraded the base appearance.

Observation #242

81. Overall support is pretty good. Recent installation of dishwashers into family housing was poorly planned. The installation reduced the available storage space by almost triple what the dishwasher displaced. This indicates poor planning.
82. The row housing for field grade officers is extremely space limited especially compared to some of the palatial southern housing. Enduring the winters up here is difficult enough w/out having to store dishes and other furniture because there is just insufficient space. In 15 years or more Air Force personnel acquire many things. It's really frustrating not to be able to use them because they must be stored. If I thought I would not be stuck with a house I could not sell, I would definitely live off base.

Observation #247

- 81. Operations of self-help programs especially for family housing is of increased benefit. Need expansion in this area, making material more readily available.
- 82. Majority of facilities on base are old and in need of replacement. Costs and the annual budget preclude any rapid development in this area.

Observation #253

- 82. Work area is the absolute best I've seen for a tactical squadron in 19 years in the AF. Base housing might be the worst; 1300 sq. feet, no air cond., old.

Observation #265

- 81. (Dislike) Streets are in constant disrepair.
- 82. (Dislike) Windows in office area are frosted instead of clear glass.

Observation #268

- 81. For the most part, everything is kept looking neat and repairs don't seem to drag on.
- 82. I'm in a flying squadron and our facilities are part of a maintenance hangar. They're kept in reasonably good condition, but they're old, and because the offices are on two sides of the hangar, the configuration is not well suited to performing our mission. But, this is not CE's fault.

Observation #273

- 82. We have many new facilities. They look great and all utilities are functional.

Observation #279

- 81. Civil Engineers seem to be disadvantaged when called to design and adjust mechanical engineering things.
- 82. Concrete seems to get a lot of quick, interested workers. Air handling is too hard to do - suspect the training.

Observation #284

- 81. Great group of people. Can-do attitude.
- 82. Excellent.

Observation #288

- 81. For family housing, all work is contract. They do a much better job than what I remember when CE had the responsibility.
- 82. Tremendous improvement in facilities since I left here in 1980 and returned in May '88. Now MCP, plus upgrade of older construction facilities -- hat's off!!

Observation #292

SARPMA is our base CE.

Observation #294

- 81. CE is the worst unit in the entire United States Air Force. They are unresponsive and uncaring.
- 82. The condition of our base facilities is excellent. CE has very little to do with the condition of the facilities - it is mostly accomplished through "details" and self-help projects.

## BUILDING CUSTODIANS

### Observation #1

- 81. Base CE at WPAFB ranks as one of the top 2 I've seen in 25 years service.
- 82. CE does a particularly good job, especially when one considers the technology they often must work with. This is especially apparent in the 50's technology we often see in heating/cooling systems.

### Observation #4

- 81. The BCE does a great job.
- 82. Old, energy-inefficient, too crowded.

### Observation #29

- 81. Much improvement to facilities have been made. However 30 years of neglect and poor planning by those who went before [illegible] have almost created a situation that is unworkable. Much still needs to be done. I think the requirements are being identified.
- 82. McGuire is improving. Dollars and time will help.

### Observation #31

- 81. Do not keep base advised of why projects are taking so long to complete, i.e., caused by contract default.

### Observation #35

- 81. As building manager most work is done by myself. Funding is very low and I cannot get the materials. Many requests made by me to CE for materials are answered with- We are broke! We have no money. This applies to self-help projects also.
- 82. A lot of new buildings are being built on base as far as upgrading I feel a lot of money is be wasted on buildings scheduled for destruction. This money could be used elsewhere.

### Observation #36

- 81. Having lived in base housing over the last 6 years I was extremely displeased with contract renovation

projects-poor & unlasting job construction was approved by local CE inspectors - within months local CE personnel were required to return & repair faulty work. These discrepancies were brought to the attention of the CE commander to no avail. Most local repairs to my on-base housing were unsatisfactory. As a recent homeowner, I would not pay for the type of work I received while in base housing.

82. With congressional funding cuts as they are I understand why some upgrade projects were placed on the back burner. Better use of available monies would be nice.

Observation #41

81. Routine job orders frequently canx with no notices or explanation. Our priorities are often times ignored. Occasionally work orders "disappear" after 1 or 2 years and we are told to start over and resubmit. Host majcom gets priority at all times. CE system stinks, the workers however are very good & professional once you do manage to get them on the job.
82. New facilities are very well designed and have an attractive appearance.

Observation #42

81. The plumbing in the dormitories maintained by a civilian contractor is very poor. There have been times when I personally have been without hot water for more than 30 days. This is disappointing since the dormitories are new.
82. Good response time in maintaining roads during winter time.

Observation #44

81. CE needs to be able to maintain a better benchstock. Too many times parts need to be ordered.

Observation #45

81. For a self-help project it would be helpful if a CE representative could be available to offer suggestions and alternatives.

82. Most facilities appear to be maintained in an adequate state of repair. These facilities and areas that are frequented by the higher ranks appear to receive much more attention.

Observation #46

81. Each DCS identifies top 5 work order priorities. These get worked.

Observation #47

81. Its good to have a nice looking base but I think too much time and money is spent on beautification.
82. I think we have some of the finest facilities in the Air Force but lack some on the maintenance of them.

Observation #50

81. No sensitivity to needs of people and people programs in work place.
82. Facilities are adequate but need better SMART team support.

Observation #54

81. Not applicable. SARPMA does majority of the work in San Antonio area.
82. Infrastructure worn out. Need \$ to fix.

Observation #57

81. Not enough coordination between CE planning and building custodian in planning stage. Failure to ask questions/advice from building custodians, especially during renovation.
82. Athletic facilities, i.e. outdoor lighting, fences, ball field surfaces, lack of underground sprinklers for ball fields.

Observation #58

81. Dislikes would be non-availability of parts for A/C and heating units. We have waited as long as 30 days for repair of some units.

CE personnel are courteous and overall seem to know their business.

82. A lot of our facilities are WWII buildings. Most are due for renovation or destruction. However, if the facility you occupy is scheduled for destruction, even 2 or 3 years out, it is sometimes a problem to get required maintenance.

Observation #61

81. Since Lackland AFB does not have a civil engineer sq. I tried to apply the answers to the way SARPMA works and responds.

Civil engineers became a squadron 1 July 88 in which is a more positive approach.

82. Within the last 3 years Lackland has come along way in construction, renovation and demolishing of facilities due to commanders getting involved & making sure CECCORS is programmed to the max.

Observation #62

81. - No sense of urgency. Rules, guidelines for scheduling work not clearly understood and enforced by CE.  
- People act as if it is just a job not a profession  
- "Need good leaders"
82. - They are good because of self-help "not CE"

Observation #64

81. - Ceiling in office fell in. Took six months to replace it with a suspended ceiling. the new suspended ceiling has fallen in twice, luckily with no injuries. We are still waiting after 3 months for repairs.  
- Front steps on building have been roped off for months since they are a safety hazard. We must use fire escape type stairs to get to work. The stairs should have been repaired or replaced years ago.
82. - Toilets and urinals constantly stopped up or won't shut off. Civil Engineers have returned several times but no permanent repair.  
- After several years a sidewalk was put in between building and new parking lot. It took about 13 people and several days to construct sidewalk which two people could have done in one day.

- Air conditioning in building hasn't worked properly in 4 1/2 years. Mold grows on books and vents due to excessive moisture. Numerous calls and visits by civil engineers and bioenvironmental engineers have yet to correct problem.

Observation #65

- 81. Doing the best they can.
- 82. Housing is Early American ghetto. Too small and falling apart. Probably the worst housing in the USAF.

Observation #66

- 81. The SARPMA civilians spend more time trying to get out of work than accomplishing it. They send 3 men to do a one man job, then stand around for 4 hours while deciding what to do; then they turn it over to another shop and disappear.

Observation #67

- 81. CE needs to coordinate with building managers. More follow-up by CE is not accomplished. A lot of work not completed and accomplished and is closed out. Print outs should be furnished to managers of work submitted.
- 82. This base does a lot of self-help, repairs/landscaping and etc. We have a lot of old buildings - CE has a big task here.

Observation #68

- 81. NEW SQUADRON FORMED - 1 JULY 88, 3700 CES  
I'm reporting from a San Antonio base supported by SARPMA - never in the history of mankind has there been a more ill-conceived idea which translated into the most incompetent, wasteful organization sanctioned by the USAF. CE's should be contracted out under 44 28 concept in order to rid ourselves of antiquated, bureaucratic procedural incompetency. CE's simply can't respond because they're so bound up in regulations.

Observation #72

- 81. (1) Part IV We have no problem with the response time from our CE's, though the actual repairs take much longer. (2) Also in Part IV, comparing my

home to a building that has hundreds of people is not a true picture.

- 82. It seems to take CE forever to get parts such as motors for vent fans and pumps for air conditioners.

Observation #73

- 81. The recent implementation of customer service "zones" seems to work well. The prioritization of work orders and the completion of our top 5-10 on a routine basis is great! Since Col. Chace took over as CE commander things have steadily improved - superb leader/innovator!

Observation #76

- 81. Outstanding support.
- 82. Need gym in Youth Center.

Observation #77

- 81. The dissatisfaction is not with Civil Engineering but with paltry funding support given by MAJCOM, USAF and the Congress. The biggest irritant today is too few \$ for the self-help program. The program should be funded to \$1 million minimum on every base. At Vandenburg AFB, it should be \$2 million minimum. This survey attacks the wrong issues & problems. The ? is how can the Civil Engineer maintain a reasonable level of service in the face of killer budget cuts?
- 82. The Professional Facilities Program is a lie and an abuse of taxpayer's \$. We're making admin & office areas plush, yet we cannot fix the roof to keep rain off our computers & precision equipment. Dumb! Stupid! The focus of CE must be on quality facility maintenance not on comfort & aesthetics. Someone needs to do a paper on the stupidity of the Excellent Facilities Program in this environment of gross underfunding of fac O & M programs.

Observation #78

- 81. BCE doesn't have much choice. Seems to be a fight among the ranks. Who's got the most pull.
- 82. Older fac. are not up to standards of the private sector. It seems CE seems to always have to set the example.

Observation #79

81. I've been building manager for about a year and have noticed a great increase in helpful attitude from Customer Service desk and CE work force. We have critical needs in our facility for climate control (for computer) and always receive prompt attention. Any work involving AF Form 332 seems to take a great deal of time to see results, especially work just to make the place more attractive. We waited a month to get a leaky window fixed and are still waiting to hear about grounds work needed to beautify and control rodents after two months.
82. Our building is only 5 years old and has been well kept. New facilities on base are going up left and right and old ones remodeled. I like the way they are consolidating the finance and CBPO into one building.

Observation #80

82. It seems like things that break down (air conditioners, heaters) are the things that always break down. Be it old age or shoddy maintenance, it's always the same thing.

Observation #82

81. Extremely polite and helpful when requesting work.
82. Facilities designed and built during 1950's for SAC. Not the best design for TAC.

Observation #83

81. Most craftsmen are helpful and courteous when responding to a call. Having a single point of contact at CE creates an unneeded bottleneck as the person usually does not have the requested info readily available. Getting maintenance performed on installed sound suppressors or hush houses etc. is difficult to impossible even though CE support is required by AFR 66-5.
82. Due to the dryness of the area, dust creates a very real problem during periods of high winds. More vegetation, grass, shrubs, etc. would be helpful in alleviating this hazard.

Observation #84

81. We receive excellent support from CE - we feel they care about our hotel - they are friendly and show a lot of enthusiasm in our operation.

82. The facilities are old but CE keeps everything in good repair.

Observation #85

81. CE personnel are fairly courteous but at times I get sick of hearing "it's not my job." Many of the jobs in my area as a manager are done self-help. Response from CE, unless you know someone, is unreal.

82. Like the new headquarters building--wish we had it!

Observation #87

81. 1) Spends too many manhours and resources working on their own facilities.  
2) Always asking for funds from wing managers for doing routine maintenance.  
3) Unable to schedule manhours for work orders which are "materials complete."  
4) All renovation is either done self-help or contracted out.

82. 1) Majority of dormitories built in early 50's (substandard).  
2) Landscaping non-existent, some self-help efforts. Grounds maintenance - unable to get contractor to be responsive - do work.  
3) Facility Utilization Board - ineffective; no long term plan.

Observation #88

81. Since the activation of the ROOMS Project, I feel that CE service has gone from highly commendable to highly unsatisfactory on this base. Both the quality and quantity of repairs has been hindered because there is a severe lack of manpower and equipment to support all of the zones.

82. I feel most of the facilities are in fair shape. CE at Beale AFB does not maintain its housing facility it has been contracted out with a high level of dissatisfaction with customer service as opposed to commendable when CE did maintain the housing.

Observation #89

81. Those "things" being done are the "things" which have command or high rank interest - other areas get neglected.
82. Very few buildings look very professional - just the minimum is done when funded.

Observation #90

81. Seems it takes quite a length of time and getting personnel involved in getting certain jobs accomplished.
82. I feel everything done around the base is done for the benefit of the students and not the permanent party personnel.

Observation #91

81. Most of the problems seem to come when services are contracted out. Paint contract took 1 year to resolve. Also, CE is terribly undermanned and as a result many NAF people have to take up the slack.
82. Facilities are good to great and SMART team tries but is too often unable to get adequate support for ordering parts and materials. I like the idea of dividing the base into zones and giving teams ultimate responsibility for keeping up that zone. This breeds competition and pride and also helps provide a broader training base than in a specific shop.

Observation #93

81. Poor response of contracting to problems of facility managers. CE cannot get companies to respond to complaints with construction work.
82. Poor contract cleaning. Smells like F,W & A.

Observation #94

81. I haven't dealt much with CE but on the times I have they have been fantastic.
82. I think base housing is cramped - the living conditions are too close for the amount of people here.

Observation #99

- 81. CE is doing an OK job; but the time it takes from the initial request to CE actually coming out to begin work takes a long time.
- 82. Some facilities seem to get more attention than others and sometimes when you want to improve your facility CE tells you their zone is out of money.

Observation #100

- 81. I work in an aircraft maintenance hangar, which is used sometimes for ceremonies. When the hangar is evacuated it is one and two weeks before any work is started towards preparing the hangar.
- 82. It appears that CE waits as long as possible to begin a job, then must rush to get it completed on time, which makes a nice looking job that doesn't last.

Observation #103

- 81. CE is responsive, prompt, courteous, highly motivated and has excellent craftsmen. CE maintains the base in excellent condition and they seem to take great pride in doing a good job.

Observation #104

- 81. I don't have any problems with our CE; they seem to stay on top of everything.

Observation #106

- 81. Under the new system they are faster, more effective, than before. At the service station here, a lot of things got done in a few days that had been put off for years.
- 82. I like how quick they respond and how quick they get the job completed. Like the men's restroom - for months I tried to get the toilet fixed. Water ran 24 hours a day for months. Within a day after it was reported to the new crew, it was fixed!

Observation #107

- 81. Excuses seem to be easier in some instances, i.e., one of our facilities has been without power for

over a year. It was caused by an electrical storm and we have received every excuse from "we had to order new cable," to "we would have to close the ramp to replace it." The cable runs underground through a pipe, the cable has been received, but still no power to our Munitions Holding Area on the flightline here at Luke AFB, AZ.

82. For the most part, all facilities are in good shape, but in some cases sub-standard items are being used to cut costs. In the long run it ends up costing the government twice as much because it has to be replaced much sooner than a commercial grade item. i.e., electric motor at the MSA entry point. It is broken more than it works because a cheaper motor was acquired instead of the industrial quality motor that was requested.

Observation #108

81. This survey is a joke regarding the CE at McConnell. I have moved into a new facility in Mar 88, critical machinery is still not hooked to electrical power. Response to required work is very poor. To get work accomplished one must become the "squeaky wheel" making constant in-person threats and complaints. CE repeatedly claims no money, no people - I have yet to see overtime. We could operate better and cheaper by Form 9 to local civilians than through CE.
82. Many facilities are new, due to BIB. They are in good shape because they are new, this is the only reason.

Observation #109

81. Stays ahead of the power curve by having many O & M projects design complete at all times. Almost everything that is within their capability to do they do well, the first time.
82. Numerous types of heating and cooling systems installed over the years present a real problem to BCE to obtain spare parts and maintain them. The AF BCE community should attempt to adopt a requirements contract approach and standardize systems.

Observation #111

81. If the CE Sq. had a policy of communicating with building managers prior to starting work, it would

greatly improve their repeat call-in workload. Also the exact work or problem could be identified and corrected. Also the work request routing of AF Form 332 I think is too long and the paper work gets lost in the shuffle. Communication with the primary work section could be better; building managers are not allowed to call direct to primary work sections.

82. I feel the overall condition of the base facilities is good. I am quite comfortable with Altus. I don't agree with all the Air Force's contract procedures, i.e., it takes too long and the cost of the project is increased due to the time lapse.

Observation #112

82. Light-colored tile floors: shows dirt, scuff marks very easily. Darker colored tiles could reduce upkeep cost; better yet just carpet all tile floors. CE's mistake in the design of Bldg. 91025, the sewage pumps are on the front (roadside) of the building.

Observation #116

81. Maxwell AFB, AL: Improve the contract management of housing. Take care in preserving the historical houses on base.
82. Stop tearing down useful and historic buildings. Renovate if necessary and use what we have.

Observation #117

81. Your main problem is procurement of materials, especially for self-help. All self-help and renovation requests are delayed by lack of available materials. Also the government gets screwed when buying paint etc. locally. We need larger bench stock like the good ole days.

Observation #119

81. Several work orders have been cancelled out by BCE without the knowledge of our squadron. When inquiring as to why it was closed, they say they haven't got any record of it, that it must have been completed. Four of these work orders in particular are over 5 years old and have been cancelled at least 3-4 times each. This is getting very frustrating because each time it must go back to planning, cost assessment, etc., which all takes time. (Referring to equipment tower and shelter

painting.) I do not want to hear...."Well just submit a new work order."!!!!

82. A majority of the facilities on base are in good condition. However, BCE is only partly responsible. A large portion of maintenance that I am aware of is performed through self-help projects. Also my equipment shelters and tower still need painting.

Observation #120

81. Given the budget constraints, I feel they do an excellent job.
82. Housing quarters are definitely sub-standard! The kitchen has 20 year old plywood cabinets; no room for storage (closet space); no basement; no central air - mainly cooling. The windows are not removable; therefore you can't even place a window air conditioner in them!

Observation #123

81. CE ought to be contracted out. We might get better service.
82. A warehouse by any other name is still a warehouse.

Observation #125

81. Base support is about average (satisfactory), however, the airmen that accompany their civilian counterparts are below average. It seems that the airmen do not know their jobs very well; maybe they need to improve the tech schools or a better OJT program!
82. The quality of our base grass cutting contractor is far above average -- hope it keeps up.

Observation #126

81. Dislike- 1) We are required to use our own project funds to get a decent response. To use CE's own money takes months. 2) Self-help store is always out of something. 3) The grass around my office has been mowed once in the last nine weeks. 4) Too many people outside of CE and my own organization have to coordinate on work requests.
82. 1) We have no air circulation in the building when the air conditioners are shut down for winter. 2)

Phone service is good but slow. 3) There is no landscaping, gardens, flowers, or anything but grass and old trees outside of base housing. 4) Recreation areas, parks, picnic grounds are particularly sad. The gym Building itself is pretty good. 5) If something breaks right after they fix it, it takes as long to re-fix it as it took to fix it the first time.

CE used to be a lot better 10-12 years ago when they were all blue-suit and had crafts and material on base. Now it's 100% contract, and they suffer terribly on responsiveness, flexibility, continuity, and who's-in-charge. You can't get anything from self-help, either. More than 12 times the last 2 1/2 years I have bought bits and parts with my own money and fixed things at night in civilian clothes. I've never seen it as bad as it has been lately.

#### Observation #130

81. Over the past two years, such support has been minimal. Our base CE was part of a central organization - SARPMA - which serviced all government installations in this area. It may have seemed like a great idea but it didn't work. Abuses by the civilian work force were commonplace. It became a huge bureaucratic monster that went in all directions - accomplishing very little - anywhere! All work orders were "in the computer" but your turn never came. As of July 1 we are returning to Base HQ. and level CE administration and support, so we are all hoping for improvement. Time will tell.
82. We have been here about 10 years now. Over that time there has been a gradual improvement in the facilities - especially the exteriors. In many cases, we're still stuck with an old building. Wiring, plumbing, etc. is inadequate or outdated. It may be difficult to repair - really needs to be replaced, but who has the money. We now have a new BX and Commissary, but upkeep is not always what it should be. Self-help projects are used a lot here, or Prime BEEF teams. The grounds and landscaping show the biggest improvement but even a lot of that was self-help. No one has the money to provide the services needed.

#### Observation #132

81. When dealings are with individual shops work

progresses well. When submitting work orders without contacting shops, work orders will be on hold due to manning. I currently have work orders awaiting manhours that were submitted 15 April 1986.

82. Quality of facilities on base are being updated, some with speed and some without.

Observation #134

81. Particularly dislike checking on status of work orders and being told they were completed on X date when I was never contacted that a repairman had appeared and I've still got the problem. Do like being able to check the status quickly through Customer Service. Most CE folks are very good to work with and the response time on most repair work is good. When designing a change or upgrade to an area or facility, wish I could get what I need instead of a more expensive Taj Mahal - if I say window A/C will be used, don't design in central air without talking first.
82. Since this base gets a lot of DV/VIP traffic, we are constantly pounded on for appearance and CE gets the lion's share of the pounding. Col. LaFoy's positive attitude and ability have not only upgraded the base, they've improved perceived and actual CE service at Bolling AFB. Things aren't perfect yet, but progress is very apparent.

Observation #135

81. We are not allowed to communicate with craftsmen involved in work orders. No communication from CE on majority of work orders. People sent from CE to accomplish work orders without any notification. We pay for work done, but no accountability from CE re hours worked and number of people to accomplish tasks.

Observation #137

81. 1) Quality is not job one! Example: The paint shop doesn't properly prepare the surface of a wooden building before painting. (They are too lazy to chip the old paint off.) The quality of paint was inferior, or cheap. 2) It takes way too long to order materials in order to complete work orders. (Material Control is too slow!) 3) Some work orders are closed out by CE when, in reality, they were never completed. This requires the building manager

to re-submit work order requests. This is time consuming. 4) Customer Service is a layer of bureaucracy that often gives you inaccurate information, with answers like "I'll get back with you" or "the computer shows your job order is closed out." You get a lot more information from the shop foreman or craftsman. Another popular answer is "the computer is down and we can't do anything for you until it comes back up."

82. 1) Air conditioner units are sometimes installed improperly. The units themselves are not top of the line units. They break down too often. The technicians try, but probably need more tech school training. We lost 9 compressors during a 5 year period due to improper maintenance and inferior quality materials. In summary, CE needs to provide quality materials, not the cheapest priced materials. This, of course, is an Air Force purchasing problem and regulations that CE inherits.

Observation #139

81. I particularly dislike the time that it takes CE to respond to my work orders. There seems not to be any reason for the CE personnel to get to the job as soon as requested. I have certain work orders that are still in the planning stage for over 2 years.
82. The conditions and facilities on Norton AFB are notorious. The buildings on this base are from World War II. How can anyone who comes to the base, especially newly recruited airmen and civilian guests, ever feel that this base is an important organization in Southern California. We must update our facilities for not only morale, but also to save money in building new and more efficient facilities.

Observation #140

I have very little contact with CES, my NCO's do the (illegible).

Observation #141

81. The planning and scheduling system needs to be improved. Maybe meet more often and get quicker status reports.
82. Overall okay, most of the buildings are new.

Observation #142

81. I like the "open door" policy which permits me to deal with all personnel to resolve problems.
82. LOVE the self-help program with supplemental CE personnel - such as a lead carpenter, a lead electrician, etc.; accomplishing work in this manner has saved the government over \$100,000 in our organization alone.

Observation #143

81. They provide excellent support - very cooperative.
82. Take excellent care of base facilities.

Observation #144

81. Takes too long to complete projects. EX. I had a work order to remove a generator from a building submitted in 1982. Printouts stated it was assigned project #xxx. When asked the status last month, they could find no data on the initial request. I also have 3 other projects that were treated the same way.
82. Lately there has been increased emphasis on facilities inspections and competitions TAC wide. Due to the funding crunch, paint and supplies for upgrading the facilities' appearance is not available through CE self-help.

Observation #148

81. I find it very difficult to obtain status information about work requests that have been submitted. Projects get buried. I have some projects over 5 years old that still are not being worked.

Observation #152

81. CE provides much lip service, but little quality. Their bureaucracy is mind-boggling and their reply to requests is "we can't do it without overhire" type manpower.
82. Old, costly to maintain. New building is at less than a snail's pace. CE purports that their program is aggressive here at Davis-Monthan, but other than dormitories we haven't changed much since the

50's/60's.

Observation #154

81. 1) Politics run the show. 2) OWC more important than mission work. 3) Union rules??
82. Building built in 1953. Renovated partially in 1974. Mission changes constantly, building does not!! Both water quality and electrical services must be upgraded. No fresh air. HVAC designed by caveman!!!

Observation #155

81. It seems that the only projects that get a priority here are anything the general wants. Everything else has to wait for parts or funds. This is B.S.
82. The only buildings that get a facelift are buildings the general works in/lives in/visits often (Bldg 1606, BX, O Club). How about the Child Care Center, athletic fields, sidewalk lights?

Observation #156

81. Supervisors never follow up on jobs or check on craftsmen. Problems exist in upper management and not with the craftsmen.
82. Since the base started contracting out grounds work, the overall appearance has worsened. CE Roads & Grounds workers did a much neater job than the private contractors.

Observation #157

81. I work in a large jet engine test cell. It has its own hydraulic, pneumatic, fuel, CO2 and elect. systems. Small problems are usually resolved fairly quick. Larger jobs such as floor work, inside painting (run area) and roof leaks take months to years. I would like to see a little more special consideration for my particular situation and the problems that go with it.
82. I think our base as a whole is very well kept and I thank CE for their part in this.

Observation #158

82. This survey does NOT address the FACT that what gets

done on any base is what the Wing Cmdr, Base Cmdr, or any General wants done. Money goes to the projects that the above desire. Only if you get the face time may you get the money for your project. Hey, face reality in the real Air Force!

Observation #159

81. On work orders that are submitted, takes too long to get feedback on job submitted. You call to find out, you are always told to call someone else.
82. Most facilities need new ceilings and painted on outside.

Observation #160

81. The base civil engineering squadron supports the base in a great way. Their services to the tenant units are great.
82. The tenant unit facilities are in great condition, thanks to the civil engineering support.

Observation #161

81. It is a good organization if you feel like shortage of funds is a reason for falling behind on work orders.
82. It appears that several facilities are not worth all the expense. Would be more feasible to rebuild.

Observation #162

81. Civil Engineering should provide expeditious service to unaccompanied personnel and transient housing. Many things that go wrong in other areas can be put off. A stopped-up commode in a bathroom shared by 4 enlisted persons is certainly of greater priority than a commode in a 4-stool latrine in a maintenance shop.
82. Much self-help goes into maintaining our transient facilities. The refreshing attitude of our recently departed CE was certainly a plus for our UPH and transient facilities.

Observation #165

81. The SMART team at Shaw AFB is extremely professional and customer oriented.

82. The facility I'm in - CBPO - is old and run down. A new facility is being built; hopefully the new facility will provide an atmosphere conducive to customer service.

Observation #166

81. CE responds quickly and are very efficient. However, their very limited stock of parts cause delays in repairs. COCESS is a complete rip-off of military funds, but our personnel make the best out of a useless system.
82. Base still uses WWII facilities for office space and the majority should be condemned. However, through CE self-help projects and their expertise, these facilities are made livable. My hat is off to our self-help folks.

Observation #170

81. I think our Civil Engineering personnel has outstanding support for the base. That is why we are "Best in TAC!"
82. I think for the most part the facilities are kept in good repair. That is why we have won the "TAC Facility Inspect" 2 years in a row.

Observation #171

81. Nothing to speak of.
82. They are really nice and getting better.

Observation #172

81. Right now I feel they are in an improvement phase. They are good, but could be better, and they are working on it. If they don't drop the ball we will have an excellent CE team.
82. The base is finally putting money into improving things on the base. Many old buildings are being torn down and replaced. I don't like the idea of having people working out of condemned buildings like we have now.

Observation #174

81. The CE Squadron, other than the commander, doesn't

give a darn or gives that impression. Our toilets were down for over a month; excuses is all you get. There are projects that were started 3 years ago that still haven't been completed. When they do complete one, it looks like darn. Wall outlets stick out from wall holes, cut too (illegible). The only way things get done is to personally involve the commander.

82. The higher rank you are or the closer the project is dear to the heart of the Base Commander, the better it looks. The only reason my toilets ever got fixed was because the general came in one day and I pointed it out to him.

Observation #175

81. CE has always been very helpful with our building and the maintenance people are great.
82. Facilities are in good condition, the ones we use.

Observation #176

81. As a member of the civil engineering squadron, the noteworthy current achievements being done at this time and should be recognized is that CE is now operating at 1/10 of their previous budget. Although service may have declined a little, credit should be given to the men/women of CE for their tremendous efforts to maintain their past efficiency. I don't believe they should be saddled with the 1255 program while other service squadrons are not.
82. I have no particular input for this question.

Observation #177

81. I don't like the "top 10% work order" rule. We are a small organization and we don't even get a "top 10%" but our problems are as important as the big organizations.
82. Our facilities are excellent.

Observation #178

81. New zone maintenance works great so far!
- Renovation/replacement takes too long!

Facility management is too complex for ave facility manager.

82. Hospital & dental clinic need immediate replacement.

Observation #180

81. I like the 1255 program that lets you tell the base commander how well or how bad a craftsman performs. I think base CE on this base would rate with the best.

82. This base is growing and new facilities are going up fast. One of the best bases in the Air Force.

Observation #183

81. I have one complaint. When CE comes to the building to work on an urgent work order or any other type work order they don't always check with the building manager. Also when they complete a job they don't let the building manager know what they did.

Observation #184

81. Too many people responding to calls that do not know what they are doing. Work orders that have not been completed that are more than 1 year old. Never know the status of a particular job.

Observation #185

81. BCE response rate is positive and mission oriented. Base appearance is of special command interest and results in very pleasant working conditions.

82. First class facilities. . . my job gives me the opportunity to visit bases of several different commands and TAC bases always shine. . . we are spoiled!

Observation #186

82. We work out of a class 3 building. We don't get any improvements unless they are safety oriented. Or the Base Commander wants them. It would take 1/2 the cost of a new facility to make current facilities come up to NEEDED standards. If a contract is let, then how can a command commander say let this go I need this done instead.

Observation #187

81. There are isolated incidents where the personnel I deal with are really great. They are very helpful and really try and do a good job. Generally you have a feeling of "I really don't want to hear about it." Keeping me abreast with the progress of my W/O's is very poor. I have to really search out the status of open W/O's.
82. The facility I work in is just two years old. It is a nice facility. However, the roof already leaks and it has been nearly a year since the problem was identified. No corrective action.

The facilities in general are very old and truly warrant replacing. I'm sure as money becomes available the situation will improve.

Observation #188

81. Dislike fact- most of the time CE craftsmen do not contact me upon starting or completion of work. Most CE personnel are friendly and cooperative. However it is not uncommon to fix one problem and to allow a newly found problem that could easily be repaired, now requires a new work order.
82. Our building needs a new roof. During summer we cook. During winter we freeze. Ventilation in warehouse is poor.

It is very clear that headquarters gets top priority on jobs.

Observation #189

81. The craftsmen are for the most part friendly, courteous, and informative. I seldom have difficulty with them. Although some times I get the run around from service call and get bounced from one place to another when they could have handled the problem themselves.
82. At this time the facilities are in the best shape they have been in for a long time.

Observation #191

81. A newly implemented zoning concept for handling minor repairs has greatly improved service.

General officer housing should not get any higher priority than the rest of base housing.

82. CE designs functional but drab buildings--go with professional A-E firms.

Observation #193

81. Facility managers need status reports. Often you have to chase these down.

Observation #194

81. - Too much emphasis on paper work-- not fixing problems.  
- Lack a sense of urgency and too much inability to do two things at once. If you're doing big projects, little things don't seem to get done and vice versa.

Too much poor planning and therefore lost time on projects in execution. Too many work orders for the people to be responsive hurting credibility--but the G.I. doesn't put overtime in either.

82. Condition and quality is fine--upkeep and improvements are too slow. People should not have to live with irritants and problems for long periods of time. Long range projects shouldn't be so long or disorganized that you never get a warm feeling it will be done right or in a reasonable time (within years).

Observation #199

81. I like the support I receive when work request for military housing. It has been no less than excellent. However, support for the building in which I was a custodian was very poor. The wrong shop was dispatched for an emergency work order, and a year later a permanent repair to the situation had not been done.

82. There is a big problem with frozen water pipes in aircraft hangars. But in general the conditions of facilities is very good.

Observation #200

81. Civil Engineering is accomplishing the work in an outstanding manner. The lack of funds and manpower is a problem with maintenance, repair or construction of facilities. Contract of maintenance

requirements is not always the best way to accomplish small work requirements. The CE can and will perform as good with the necessary resources. It should remain a mix of both contract and in house.

82. Vast improvements have been accomplished over the past five to six years. The size of our family housing units are small. The square footage authorizations should be increased. Parking area within the housing area must increase and this problem is being worked.

Observation #202

81. Only comment about Part V: Budget constraints hinder accomplishing most work. Support is adequate--gets us by.
82. Facilities are repaired when we get the attention of the base commander--otherwise ignored. Example: After seven work requests and two months time, a broken water pipe was repaired after calling the base commander. A leaky roof causing furniture/rug damage was repaired (somewhat) only after contacting the base commander's office. Work orders existed for 18 months. The roof still leaks!

Observation #204

81. The lift truck used by CE is a critical item and spends far too much time in repair. More lift trucks would enable CE to respond much better to high roof lights and leaks.
82. Seymour in general is super, but some MWR facilities need to be improved or replaced. The youth center is a fire trap and a hazard.

Observation #205

81. Street repairs on the base appear poorly coordinated. Traffic flow has been disrupted ever since I have been assigned to the installations 2 years plus.
82. Too much money is being spent to beautify already "adequate" facilities.

Observation #206

81. Civil engineers do an outstanding job on this base.

82. I don't know about all facilities, but most are first-class.

Observation #208

81. Civil engineering are trying to do their best. But due to budget cuts in O&M funds and manning cuts to O&M shops, it is hard to meet all requirements.
82. My facilities are the oldest on base but due to cuts in MCP programs, it will be 5 to 10 years for replacement. Our buildings are [illegible] 1950 construction wood frame buildings.

Observation #209

81. They continue to attack the problems even though they are faced with old facilities and a climate not conducive to long facility life.

They have allowed a fairly large number of non-productive civilian and military personnel to become dug in and obstructive. The squadron is choking on paperwork. Planning is particularly a problem and a wing obstruction.

82. Facilities are for the most part over 25 years old and in need of total renovation or replacement. There is no real base plan for insuring the upgrades occur or that the money is available.

Observation #211

81. Fast response, excellent work with limited funds.
82. Facilities grounds maintained by detail teams consisting of airman basic through tsgt.

Observation #212

81. A lack of communication when a job is being done/ finished. A habit of walking on a job and walking out without a word to the custodian or a note to let them know that someone has at least checked on the problem.
82. As a tenant unit our facilities are in good order with help from our majcom funding. To have something done sometimes has been worse than going to a dentist.

Observation #213

81. Generally the CE personnel are friendly and would like to help in most maintenance or repair instances, but often they are limited because of the availability of parts and materials. Our buildings are also for the most part very old & hard to keep up--
82. For the age of our facilities, I think they are maintained as well as can be expected with what is available--  
Goodfellow is building & replacing most of those--so things look much better & should improve tremendously-

Observation #214

81. Once you get past the customer service desk and actually talk to the people who will be doing the job, much more progress is made. At times, customer service is a hindrance when a qualified technician could solve a problem. I understand the need for a central desk but concentrated training on customer service and handling an irate customer would alleviate many uncomfortable situations for the customer. Being told we'll get to it or this is not filled out properly, re-do, when you already spent time doing it is extremely aggravating.
82. Most workers are conscientious once they get to your facility. I sometimes don't understand why 3 people are sent to do a one man job but maybe they work in teams.

Observation #216

81.
  - 1) Do not respond to letters from our commander (O-6) to theirs (O-6). Our letters are hand delivered to CE.
  - 2) Loses hand delivered work requests.
  - 3) Never coordinates on anything.
  - 4) Responds only to political pressure on base.
  - 5) Will hold meetings to set base priorities. Minutes reflect different priorities!! (no integrity)
  - 6) Absolutely incompetent design department. Every project designed has major problems, that are discovered in the midst of construction, resulting in thousands of \$ of modifications. Over and over and over again!!

Observation #217

81. I like the fact that they support all squadrons and each other in all tasks as the need arises.
82. Most areas of the base have new facilities. However the housing maintenance building is outdated. Some of the military housing units need complete renovation, particularly the kitchens. Also most of the military housing units are in need of roofing.

Observation #218

81. I primarily dislike the coordination requirements placed on all 332 items. I also feel that some of the paperwork involved in getting some things done is designed to see just how bad I want it.

Observation #219

81. Resources are spread particularly thin with the "ROOM" concept--areas of responsibility and a decentralized approach. Result: One or two carpenters for 150 buildings and concomitant poor response. Further AF and SAC have placed entirely too much emphasis on esthetics in buildings instead of good maintenance. The objective is for example, carpet, despite the fact that the roof leaks and needs repair (not scheduled 'til 1991) or a computer CPU is air-conditioned only by window air conditioners not designed for such a load (planned for 1993). Further, asphalt shingles (new) are painted to match the bases color scheme, despite the fact they're not designed to be painted and they're brand new. Yet, the heating system that keeps failing cannot be replaced. The BCE is too busy trying to satisfy the General's whims (and those of his wife) to know that projects his engineers design contain totally inadequate, poorly stated specifications and drawings.
82. Same as 81 above-- The roof leaks but luxurious carpet is installed! Your assumption about facility impact on morale and importance does not square with history or knowledge of management principles. An interesting job and well-led unit are far more important than facilities. Facilities only contribute a certain dissatisfaction if [illegible] below a certain threshold in quality. Problem: We have too many carpet "colonels" in this Air Force. People who think of an "executive" Air

Force rather than the lean fighting machine that it is supposed to be.

Observation #220

81. They do an outstanding job considering budget & manpower restrictions.
82. Excellent facilities.

Observation #221

81. CE support is dependent on funds being available. If funds are not available, CE cannot do the work free.
82. Grounds are not taken care of as they are at other bases but funds are short and water can also be scarce.

Observation #222

81. There appears to be a lack of follow-up on work orders. Sometimes work orders have to be resubmitted due to the original work order being closed out by unknown reasons.
82. The quality of buildings (7) on this site are good. You must be advised that this is an off-base test site approximately 26 miles from the host base (Griffiss AFB) and the response time would be expected to have some delay. This distance does cause problems when the craftsmen are not prepared to complete the job on the first visit.

Observation #228

81. After completing jobs in any base building, CE craftsmen do not notify building custodians and job orders do not get signed off in custodians' logs.
82. Grounds look exceptionally well.

Observation #230

82. I realize money is short. However, your question regarding the condition/appearance of my work facility in comparison to a civilian facility used for similar work really is the focus. My civilian peers work in training offices which give students the idea they have entered THE best training facility in the world. I feel the deteriorated

condition of my facility in many cases detracts from the excellent training provided by my staff.

Observation #231

81. The self help store has improved but for awhile personnel were rude and not helpful at all. Workers don't give us information at all about starting, stopping, what they're doing, etc.
82. A building scheduled for renovation can't get current work done even if renovation is years away.

Observation #232

81. CE does an outstanding job in my 28 buildings with the personnel they have to work with.
82. All my buildings are from 8 years to World War II. It takes time on my part to get the work done by myself. I try to do most of the work myself if time allows without calling CE.

Observation #233

82. Not particularly fond of 2-tone brown base wide. Understand uniformity and neatness but brown fire hydrants is a bit much. If aerial camouflage is object, prominent colors here are white or green.

Observation #234

81. The base CE does not involve the building managers in work or time and reasons for work stoppage. They don't look at problems that keep recurring to find out if a major job would repair it, but continually do quick fixes.
82. The host command does not include other agencies on quality of life programs.

Observation #235

81. They have demonstrated themselves to be effective and efficient.
82. Most facilities are reasonable. The fire station is small and in great disrepair. It cannot effectively accommodate the needs of the fire dept. It is substandard and does not meet AFR 92-1 standards.

Observation #237

81. Priorities are assigned by RANK instead of mission requirements. In other words the higher your rank the higher your priority, response time and completion. Example--Col A does not like the landscape in front of his building. Ssgt D has a safety write-up which is a health hazard. Col A gets new landscaping. Ssgt D has to wait for funds and manpower because CE spent all the money on Col A's landscaping. (And that's a fact!)

82. MANAGEMENT DON'T LISTEN

Observation #238

81. - Self help is a way of life and even then support is hard to come by.  
- It seems like for 22 years, it has been a running battle with CE to get things done.  
- Need mission orientation.

Observation #241

81. The housing maintenance office does an outstanding job as well as the roads & grounds section.
82. The base gym is not adequate for the number of personnel assigned. There is currently one playground area for dependents and it is not within walking distance of many of the family houses. It also has antiquated equipment.

Observation #243

81. CES is super. However, most of the time they don't inform me when they start work. Occasionally they close a work order that has not been corrected.
82. Our facility was built in the pre-WWII era and we are calling in numerous service calls every week. My personnel see new buildings being constructed and the organizations moving from a much more modern facility than ours (1960's). They ask our superiors why everyone within the training wing gets new facilities while we stay in a building that's ready to fall apart. What answer would you give them?

Observation #245

81. I am the facility responsible office for our Comm Group.

Presently have as of 12 July 1988--56 CE work orders on 332 forms--most always I do not receive any information when jobs are completed--I have to send to CE a copy of my computer listing.

82. As of 12 July 1988, we have AF form 1135 on file with CE 48 still open work orders not completed. CE Improvement Now Unit we have 11 jobs that have not been completed on form 332.

Observation #248

81. The way contractors get away with just about everything. Most roofs on the base are under contract but still leak. The unit contract management seem not to be able to get contractor back to repair the facilities under contract. PAFB NY
82. Half the base house units have been modernized. The other half have not. We are pay the same amount to live in the units. Started to remodel all of base housing, then ran out of money 2 years ago. They got more money and started with the same units that were remodeled 2 years prior. PAFB NY.

Observation #249

81. I'm generally satisfied with the service by CE. However, on one particular occasion, the garage door to the stockroom of my facility broke. When I put in an emergency call to CE, the representative told me that "We don't have the money to fix your door." I thought this to be an unacceptable response given the emergency situation I was in. (Shipments had to be loaded through the front entrance which proved extremely inconvenient, if not impossible, for customers, employees, and vendors.) Consequently, I had to go off base to have the door repaired, costing more than I had expected.

Observation #251

81. Returning work order request stating the time period when work will begin on a project.
82. Facilities are maintained in excellent [condition] due to strong command support to set the example.

Observation #254

- 81. CE support of the base, in my opinion, is very good. They get to the jobs in a fast manner and are courteous and professional. Their work is usually quality.
- 82. Its just like any other place. Some of the facilities are very old, so what can you do about that. But overall the facilities are in pretty good shape.

Observation #255

- 81. I would like to see closer monitoring of contractors brought onto the base for work. There have been instances of substandard work and work that does not meet building codes.
- 82. Facilities on this base are the best I have seen in the military. Most facilities are new or recently renovated.

Observation #256

- 81. Cannot get even an estimate on jobs, cannot talk directly to shops, only answer you can get on status is "awaiting man-hours." Craftsmen usually show up at housing with no prior call, we are not notified of CE jobs like lawn seeding, utility digs, etc. Jobs can be put off over 60 days and all we have is "There are priorities ahead of you." No status is given unless you really press customer service.
- 82. We are an old building which is too small for the number of people, but we will be moving in 6 months-1 year.

Observation #257

- 81. Good service when there is a real BIG problem, otherwise slow reaction.
- 82. Needed new roof and road for years at Building 1452, AUA site. Money is the big problem.

Observation #258

- 81. Excellent service. No complaints.

82. Our base is receiving a major facelift with badly needed street and older facilities being repaired or replaced.

This is a great plus for everyone as we put the WWII look behind us. I hope this continues.

All the CE personnel I come into contact with are superb.

Observation #259

81. Base CE just went to a zone type configuration. As of this date, it is not possible to determine how responsive they are to requests. I disagree with the fact that CE cannot maintain a benchstock of common used parts and materials. This causes delays in repairs waiting for materials to be ordered and received.

Observation #260

81. Base support for 833 AD side of base is satisfactory as they are part of the 833 AD. As for the 49 TFW, support is very poor in that the 49 TFW is given low priority and consideration unless there is an O-6 intervention.
82. Quality of buildings is very poor requiring constant repair of air conditioning and heating units. Airflow through out building is constant source of requested repair with response of "No funds available to repair."

Observation #263

81. - Inconsistent w/ policies.  
- Priorities of work W/R to mission.
82. - Electrical layout is not logical.

Observation #264

81. Most jobs could be done more quickly and less expensively if a job # was issued (even routine priority) instead of submitting 332/1135 so often. At my previous base, I called the appropriate CE shop and discussed the work with them before they came out. This was faster and easier for them. Current base doesn't permit it. Many wasted trips and time are the result. Let CE do base repairs, in

general, contract work stinks. Overall--CE does good work.

82. Base facilities, as a whole, are good. My building is old, has no A/C, and an old unreliable heating system. In a severe climate, such as ours, the budget should allow for an updated system.

Observation #266

81. Do not have too big a problem. Same as everyone else, has no money.

Observation #267

81. The CE response has been outstanding--I am confident when I call CE [that] a repairman will promptly respond and the malfunction [will be] corrected in a timely manner.
82. Hill AFB has the best Class VI store in the Air Force and CE's quality responses have kept it that way.

Observation #269

81. Allow base tenant organization too much in decisions affecting assignment of buildings.
82. No \$ to repair old buildings.

Observation #270

81. A common complaint/problem is the clean-up following a job. The craftsmen are often reluctant to clean up or leave before you know the job is completed. Overall support is good and helpful.
82. Due to recent renovations, the facilities are very much improved. The contractors used to paint these facilities are unprofessional and do not have the pride in their work that a military person would have.

Observation #271

81. Moved into new facility which needed extensive renovation--they did not follow plan provided--closed work order before it was completed. Still have not completed work needed.

Observation #275

81. I believe that the BCE squadron supports this base better than any base I have ever seen. I have spent 20 years in the military and have been to many bases.
82. They are the best.

Observation #276

81. CE support for MWR Division at Nellis has been excellent.

Observation #277

81. Overall Ce does a good job. Some work request take too long to get accomplished because of all the committees or boards they have to go through. The CE QC section does not monitor contract work. Some of the work that contractors have done has been very poor. When you try to get the work reaccomplished or done right, the contractor will drag his feet and wait for the warranty to expire and then CE is burdened with the problem. People who sign off on contracts need to make sure that what they sign off on is what the customer wants. We have had instances where the contractor has almost been complete with his work and someone comes and tells him that he has to redo the work because it is not what we really wanted. CE should not sign off coordination if they are not knowledgeable of what is requested.
82. Facilities are very satisfactory at this base.

Observation #280

81. I particularly like the quick response that CE gives to work requests in the base housing area.
82. As a whole, I think that the facilities on Bergstrom AFB project a very attractive appearance with only a very few exceptions which are in the process of renovation or reconstruction.

Observation #281

82. The remodel of the facility (7020) has been on tap for 3 years. Its essential for the youth--MWR mission to have adequate facilities. People complain that there is nothing for the children--the

facility is inadequate and a dump. This solution can only be changed by CE and priorities for upgrading facilities.

Observation #282

81. Currently, San Antonio uses San Antonio Real Property Management Agency--SARPM--not CE. When we change over to CE which is going on right now, maybe things will be different.

Observation #283

81. I enjoy the opportunity of talking with CE persons working here at Lowry AFB. Because, no matter whom the person is (dispatcher, craftsman, etc.) if I have a question pertaining to a work request, the time is taken to research the job and work request situation and then provide me with an acceptable answer.
82. There are facilities here that have exceeded their useability. These facilities should be demolished, not renovated. This should remove some miserable and outdated structures.

Observation #285

81. When calling in job orders request information taken over the phone as it is being entered into a computer and the caller has to wait for the computer to ask the next question until all the questions are answered. Wouldn't it be better and quicker for the work order scheduler to take down on paper the necessary information thereby not tying up the phone so long. Request that monthly work order status be provided to the facility manager of all facilities.
82. The facility I am manager of is only 240 sq. ft. Work request submitted for a new office building 1000 sq. ft. [in] Nov 85. As many as 25 military are subject to be in this building at any one time. It has a shower, teletype, 2 desks, 6 lockers, sink, toilet, AND NO ROOM. Due to politics, the work was suggested to be done self-help. We are FUEL SPECIALISTS. When are construction personnel going to do their job instead of having people do it that weren't trained to do it!

Observation #286

- 81. I am in civil engineering and it seems like we take care of everybody else but ourselves.
- 82. We keep on putting money into buildings which are going to be torn down in a couple of years.

Observation #287

- 81. The Airfield priorities appear to be low where as base proper appear to be higher. We do not have personnel dedicated solely to the airfield and many times they must be pulled off other tasks to perform airfield repairs. I believe this to be a manning problem because the personnel that do perform airfield maintenance are fully qualified and do a good job.
- 82. The base facilities overall are very good, this is an old army base and many base proper facilities have been replaced. The heating units are presently being replaced in the hangar bays now. The windows which cause much heat loss should [be] replaced and air conditioning would be advantageous to all concerned.

Observation #289

- 81. CE repairmen do not notify building custodians when they start or finish a job. They do not notify the building custodian when they have to quit in the middle of a job for lack of parts, or if there is another job with a higher priority, and worst of all, we don't know when and if they are coming back.
- 82. I am in a maintenance squadron. All or most of our facilities are very old. We get very little help from our CE people. 80% of facility upgrades are done self help. We even have difficulty getting to do the job self-help even though we use our own squadron funds on some work to be accomplished.

Observation #290

- 81. Not all shops respond with the same degree of urgency.

Observation #291

- 81. In most cases they respond quickly.

Sometimes. I must call instead of my wife--the Call in desk responds more quickly to a man.

82. There is a fine "can do" attitude to improve facilities as quickly as resources are available.

Observation #293

81. 1) The new collection work order system, where there is an approximate 2 month cycle [and] CE has approximately 5 days (now 10 days) to accomplish building maintenance, I feel does not accomplish more work than the old system with emergency 1 day response, urgent 5/10, and routine 30 days.
- 2) This also spreads some key specialists thin, like my zone 'A' only have one sheet metal person (previous none). This person (I'm told) has a lot of (priority) work. Because of this my building sheet metal problems are not worked.
- 3) CE sometimes put two jobs on one control number. When one (the first) job is completed, control number is closed out as completed. This happens sometimes causing confusion and sometimes longer job delays.
82. The appearance of the facilities are improving.

ALL OTHERS

Observation #2

- 81. I feel that CE should be trained on and perform more of the jobs that civ. contractors do such as repairing runways and roadways, fixing water lines, remodeling base housing, etc.
- 82. I feel that too much money and emphasis is put into such things as golf courses when emergency vehicles aren't kept up to par.

Observation #3

- 82. Too many people for the office space that's available.

Observation #7

- 81. I have no direct dealings with CE.
- 82. TAFB -Building 3001 - air circulation (for heating & cooling) - however due to the size & age of building not much can be done short of starting all over.

Observation #8

- 81. Base facilities are well maintained; doing job well.
- 82. Same as above.

Observation #13

- 81. Sometimes they are a little slow getting to the job, but I have no complaints otherwise.
- 82. Since most facilities on base are being remodeled or renovated, I have no comments.

Observation #14

- 81. Proper maintenance of heating/air conditioning appears not to be done. When summer comes the air is turned on- the freon is added and the repair person goes away. Not checked unless it breaks.
- 82. Office is either too cold or too hot. Not enough space.  
Old furniture. Poor lighting. No privacy which makes it difficult to concentrate.

Observation #16

- 82. Many of the buildings are old refurbished hangars made into office quarters - outdated and insufficient for an office environment.

Observation #17

- 81. Customer Service has always been courteous & pleasant & helpful. 332 co-ordination has to be run all over the base on self-help, then you do that and you have to run all over again for a digging permit.

Observation #21

- 82. Good facilities.

Observation #23

- 81. The cheap pavement that was put on dorm parking lot and the AWACW parking. It's just a waste of money, because it is slowly washing away.
- 82. Personnel living in the dorms should not have to pay to swim in the base pool.

Observation #25

- 81. The CE squadron has been good and bad depending on commanders and personnel. Some personnel are exceptional, some good, some so-so, and some bad as in any organization. Most answers are dependent on who you happen to get.
- 82. Due to the historical designation of our base, some things are not permissible. However, the base is constantly being worked on and the overall appearance has improved in the last few years. It is looking better all

Observation #26

- 82. The outside appearance of all base buildings is outstanding. However, this is not as a direct result of BCE efforts. Many squadron commanders have details of personnel to spruce up their areas. A "self-help" program is constantly in effect. There are quite a few new facilities on base that do not require much maintenance. The majority of "roads and grounds" work has been contracted out. This remains to be seen if this is good policy.

Observation #27

81. My main contact with CE is in Logistics Project support. In this area I have found them to be very responsive and excellent in carrying out the base support mission.
82. Understandably, all upgrade projects are dependent on funding. Therefore, delays and long waiting periods.  
I feel there is no single unit that can realistically evaluate all projects as to the base's importance toward a war support effort. "The wheel that squeaks the most gets the grease," regardless of war support requirements. Our main concern should be "will it improve our defense support capability, directly or indirectly?"

Observation #32

81. I would like to see some CE members trained for locksmiths.

Observation #33

81. The survey for Onizuka AFB is not really applicable. The worst experiences I've encountered were: 1) At Osan AB, CE lost work orders, so we had to start the paperwork again; civilian contractors were slow workers; the military workers were timely and responsive. 2) At March AFB, we were without power for days at military family housing. There should have been a faster way to run temporary power to housing when all that was needed was new poles.
82. Onizuka AFB needs more money to develop family housing in this expensive area.

Observation #49

81. Contracted civilian lawn inspectors are too strict during the weekly lawn inspections.

Observation #51

81. Too much paperwork and over-coordination for work orders. Work orders not followed up by CE - person submitting AF 332 not kept informed of 332 status.
82. Lengthy delays in necessary repairs - CE does not mow & rake common areas in housing.

Observation #55

81. The heating and air conditioning seems to be the worst problem we have. We have dormitories that havn't had air since the first of May. I feel this is because they don't properly check them before time to turn them on.

Observation #59

81. I live in the dorms. We have not had consistent hot water for over 1 year. Our dormitories are only a couple of years old. I can see no reason for not having hot water. The base CES has tried to fix it twice. Nothing ever came of it though.
82. The building I live in is the only facility I can see problems with.

Observation #60

81. I believe CE is doing a fine job on this base.

Observation #69

82. The whole place looks like a run-down, uncared for, and unloved shamble. Sorry about that, but you asked.

Observation #70

82. This base has made great progress in the overall appearance and quality of facilities.

Observation #71

82. 50% of the facilities on base are very old and outdated. CE is kept busy repairing things in buildings that should have been replaced long ago.

Observation #81

81. 1) Lack of coordination between housing, housing contract maintenance, CE shops; CE planning results in work orders getting lost; jobs left half completed; and frustration trying to get any kind of status.
- 2) A contract to cut the grass on base was awarded to CE instead of civilian contract bidders. Extra civilian workers were hired by CE and the work was to be completed without interfering with other

activities. The bid was awarded improperly/ fraudulently because CE roads & grounds is now neglecting other work and commanders, dissatisfied with the performance have had their GI's out cutting the grass which covers up the problem and defeats the purpose of the contract.

82. Work: EMCS & unreliable heating/air conditioning, poor response time and lack of ability/knowledge to fix problems.  
Base housing: No air conditioning despite weather that includes weeks of temperatures over 100 , no carports or garages in shell housing despite severe winters and frequent hailstorms that cause severe damage.  
Grounds: Much natural prairie around lakes and open fields on base is cut short at great expense for no particular reason. It could be left natural and would look better. The mowing also destroys nests and kills birds and rabbits.

#### Observation #92

81. My main complaint is the response time to plumbing complaints. The plumbing in base housing is horrendous. I can repair small things, but I am not a plumber. The Air Force I realize is short on manpower. But this problem needs to be looked into. Perhaps contracting to the civilian sector. I've basically been pleased with the work when it finally gets done. I waited 6 months for repair on my leaking pipes.
82. The landscaping could be improved especially around the hospital & marina. The park at the marina is a mess. Also there seems to be a need for new pit toilets at the marina- they are overflowing.

#### Observation #95

81. Spends too much money replacing items, i.e. doors, windows, remodeling, etc. of jobs in which the old items were serviceable but the people in power want everything new and the attitude is if you got the money, spend it.
82. Seymour Johnson AFB is a very attractive base and the facilities are very nice. I don't like the base's policy that you can not put up a TV antenna on base. So if you want to watch TV with a good picture, you have to pay for cable. The policy of no antennas on base has created a monopoly for the

local cable company and infringes on the rights of all the local businesses that sell TV antennas and the individuals on base who would like TV antennas. Many bases have this policy and I think its wrong, unless the base was to pay for it.

Observation #97

81. They hold their own for as much stuff as they have to do for an entire base.
82. All other facilities or offices on base look nice except for the ones up in the triangle.

Observation #98

81. I think they do a great job of keeping buildings painted and the appearance of the base is kept up great.
82. I live in the barracks and the main reason I am dissatisfied with CE is because the heat, A/C, and hot water go out at least monthly. Then it takes CE at least two days to get to it and if it occurs on a Friday you can figure 3-4 days.

Observation #101

81. CES does the best possible job with the limited funds allotted for all projects concerned.

Observation #105

81. The roads are not taken care of enough. It takes a hole of about two feet to get it fixed. Then it is usually patched poorly and left that way. Response time once a hole is large enough is usually good.

Observation #110

81. They are very quick to respond and courteous.
82. The condition of the athletic fields are very poor. To include: 1) The wire fencing is loose and curling up, exposing bare wire to spectators and athletes. The playing conditions have small rocks all over the place. 2) The grounds, especially the infield, is as hard as concrete.

Observation #113

81. I think they do a good job of supporting the base.

82. I think the base should have a new refueling maintenance shop.

Observation #118

- 81.\* Base CE does not have enough operating funds to effectively carry out its mission each year. Although we are a tenant on a host SAC base, in many cases WE buy parts needed, and Base CE put them in. I f we do NOT but them, they (CE) leave the work on back order (till next year or till Hell freezes over, which ever occurs first). They can use more personnel, also. Too much time (in my opinion) is spent in "Stand-up briefings" each day; not enough time spent "on the road" servicing the customers (us).
82. Our janitor service is terrible. Rest rooms are deplorable, and all efforts to get the contractors to "live up to the---terms of the contract" have failed. All we get is "jargon" from all concerned parties. (Base CE is in charge of this "service", incidently.) There are must be a better way to "control the contractor" or to inspect their work-- and make payment (or no payment) based on the inspector's findings. Other than the lousy janitor service, the base buildings look pretty decent. Landscaping was terrible this year. Grass grew too long between cuttings. Many locations could use new grass/flowers, etc.

Observation #122

81. Most wing commanders keep CE as well as other service providers busy on their special interest projects. This is not necessarily a CE problem, but reflects their attitude, response time, and material availability. I have over 30 years of experience of this.
82. Our facilities are approximately 45-50 years old, cramped without rooms for privacy, ill-lighted, and badly heated in the winter. Must use electric heaters at desk to stay warm.

Observation #128

81. I think they do a good job.
82. I think they are very satisfactory.

Observation #129

81. CE personnel on this base are very courteous and responsive to problems.

Observation #133

81. In the work area C/E can not seem to figure out when there should be hot or cold water. We have cold water in the winter and hot water in the summer because they don't respond when they should to turn the heaters off and on.
82. Facilities here are being continually upgraded but the majority of projects are either contracted out or self help projects.

Observation #146

81. I have never heard anyone complain of the CE squadron not supporting them.
82. Of 20 years service I have not worked in a number of buildings here at Kelly. I have never worked in a building that was of poor quality or condition; however some of the older buildings are being renovated. Some of the older buildings such as Building 43 needs improvements. For instance the air conditioning system: half the building can be cold, the other half hot. The overall appearance of the base is OK.

Observation #147

81. Working in a hospital I have no contact with CE and deal through the facility manager. My comments on CE reflect observations I have on their work. Many times I am not happy with result of their work but have to pay for it anyway. And have to call them back again, & again get charged or fix it myself.

Observation #163

81. BCE is looking @ contract maintenance for base housing. They do a reasonable job but when something major happens- basement floods & heavy rain sewage back up into it, nobody cares & the house will not be closed.
82. Facilities are being upgraded & new buildings being built.

Observation #167

81. CE just recently split the base in "zones" so certain shops have certain areas. I don't know how well this concept is going to fare, but I'm sure time will tell.
82. I like the new gym that just opened June 1st. Some buildings are being upgraded, like new roofs on dorms which was much needed. And other facelifts which add to the beautification of the base.

Observation #169

82. The decision to renovate our building was made over 2 years ago via self-help and assistance from CE. For the past 18 months, building materials have been stacked in the hall outside my section. I sit at my desk looking at bare studs which were put up over 1 year ago. The place is filthy and to clean it is an exercise in futility. They put new windows and reduced the natural light by approximately 80 percent and ventilation by about 40% and they are putting stucco on a perfectly good brick building. Most of the new windows will not open and there was no thought given to adequate ventilation or A/C. During what has been a fairly cool summer so far the temperature in our offices is above 90 degrees on most sunny days. All of this may not be the fault of CE, but they have done nothing to help the situation.

Observation #179

81. I work as clean-up man in base commissary- have limited contact with CE (only when drains clog or have electrical problems). Takes too long to fix electrical outlets. Clogged drains sometimes are not fixed as fast as should be- however due to shortage of personnel due to cut-backs.

Observation #181

81. Best in Air Force
82. Best in command.

Observation #182

81. Overall, good cooperation with the CE squadron
82. Base Service Store is always out of items needed.

Observation #195

- 81. Good Morale

Observation #196

- 81. I have always been happy with the jobs they have done.
- 82. The flags coming into Kennedy Gate.

Observation #197

- 81. They take their time at doing things and they don't keep you informed on what's going on what they're doing.

Observation #203

- 81. Being a presidential support base I feel CE and the Fire Dept support all the events, both special and regular with a very professional and courteous manner. Whether the job is preplanned or is unannounced, the CE squadron can always be counted on to support the mission.
- 82. Although the money is very tight at the moment I feel that the base is very well maintained. However, I feel that dorm rooms should be larger. Just because a person chooses to remain single, he should not be punished by living in a motel room with another person. They should have space. The room is his home for the time he is there. All rooms should be big enough to separate the sleeping area from a living area. After all, as a married person you would not invite your friends to visit you in your bedroom. Why should we?

Observation #210

- 81. In base housing, CE will not call before coming out. This creates a problem when both parents work. The best they will do is give a four hour window.

Observation #223

- 81. I feel that there is far too much paperwork and a lack of stocked items on hand or on benchstock.
- 82. Our warehouse building 1702 is one of the worst rottenest poor lighted and un-ventilated buildings

on McGuire. Of all the ware houses in McGuire, ours has got to be the worst. The water fountains are junk and the bathrooms are not fit to use for a government building. I'd be fearful to state it was a government owned building.

Observation #229

- 81. Overall when it really counts CE is prompt and effective.
- 82. I have very few complaints about the facilities I utilize on base.

Observation #239

- 81. I really can't make any comments on the way our base civil engineering squadron because I don't deal with them. But I can say that they must be doing something right because the base looks real good.
- 82. I like how the restrooms are always clean & smell good. Hallways are always clean & swept. The yards are always mowed & look real attractive. The buildings look good if not painted for awhile.

Observation #244

- 82. - Air conditioning for base housing in July & August would really be nice.
- Building 2793 is hot in summer and cold in winter due to poor heating and the absence of any cooling.

Observation #246

- 81. Lack of snow removal in base housing parking lots. Off base roads are always much better long before on base.

Observation #250

- 81. Supplies and work are slow coming, but work is usually satisfactory when [illegible].

Observation #252

- 81. The base snow removal equipment is not enough for any kind of snow storm in Denver.
- 82. The base streets are very bad because of the snow. Every time it snows they repair them a little

but they never fix them for good.

Observation #261

81. Since our office is a word processing unit, the heating and cooling system is very important. In addition to the central cooling, we have window units. After installation, CE checked several units to ensure units were working properly.

Observation #262

81. Everything's fantastic.
82. Everything's fantastic.

Observation #272

82. The overall appearance of this base (Fairchild) is outstanding!!

Observation #274

81. I do not think that our CE squadron has its priorities straight.
  1. The roof has leaked in our warehouse for a year. CE did not come and fix it until safety wrote it up because a 4' x 8' piece of insulation was soaked with water and hanging from the ceiling.
  2. The air conditioning system blows a breaker every time 3 things come on at once. CE told us to call the work order desk every time we have to reset the breaker so they can keep track of how many times that it blows so they can high prioritize it.
82. When they put in some new dormitories on base they put a tree about every 5 feet around the barracks areas and their parking lots. The areas look congested, and with the bark around the trees, will be very hard to maintain. I think they should have planted less trees and grass to be mowed instead of weeds to be pulled out of bark. 2. They just painted my house in housing. The color is not bad, but my next-door-neighbor's house is a god awful pink. When he complained to the commanders hotline, they told him that the colors had been picked out two commanders ago. When painting the painted over my beautiful wood, stained and varnished front and back doors. The secretary that works in our office is a dependent wife and lives in housing with her

spouse. They have lived in base housing for 7 years, in the same house. She asked to have the house painted and they told her it had not been painted since 1978. She offered to paint it if they gave her the paint and they said they would not furnish it.

Observation #278

81. I don't know, I don't deal with CE directly. I only deal with the fire department.
82. Facilities on the base are old but look like they are maintained decently. There are too many gas leaks. Fire dept in my opinion is neglected too much as far as being recognized. As far as production it seems to run smoothly from my point of view.

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VITA

Captain Charles M. Groover [REDACTED]  
[REDACTED]  
[REDACTED]

He graduated from Emory at Oxford, Oxford, Georgia in 1976 with the degree of Associate of Arts and then attended Georgia Institute of Technology where he graduated in September 1979 with the degree of Bachelor of Science in Civil Engineering. Upon graduation, he received a commission in the USAF through the ROTC program. He reported to the 63 Civil Engineering Squadron at Norton AFB, California in November 1979. Since that time, he has held assorted civil engineering positions with the 351 Civil Engineering Squadron, Whiteman AFB, Missouri, Headquarters Strategic Air Command, Offutt AFB, Nebraska, and the 487 Civil Engineering Squadron, Comiso AB, Italy. He entered the School of Systems and Logistics, Air Force Institute of Technology, in May 1987.

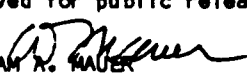
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#### ABSTRACT

This research measured civil engineering customer satisfaction and validated a civil engineering customer satisfaction model developed by Capt Kirschbaum in 1987. The research answered three questions: 1) Do the relationships between overall customer satisfaction and satisfaction with respect to timeliness, quality control, customer orientation, and communications support Kirschbaum's model? 2) How satisfied are customers with civil engineering in terms of timeliness, quality control, customer orientation, communication, and overall support? 3) What do customers expect and what do they perceive civil engineering responsiveness to be for different types of maintenance and repair?

Actual customer satisfaction was found to be most highly related to four factors: responsiveness, the customer service section, facility quality, and grounds appearance. While the Kirschbaum model was very similar, this research found some differences. The two models used different measures of quality. The Kirschbaum model included a communication factor where the Groover model identified grounds appearance as a factor.

Overall customer satisfaction and satisfaction with regard to the contributing factors generally fell in the neutral to slightly satisfied range. However, over 30 percent of civil engineering customers were neutral to highly dissatisfied with overall civil engineering support. That figure jumped to almost 60 percent for civil engineering responsiveness, the number one contributor to customer satisfaction.

In terms of responsiveness to maintenance and repair problems, civil engineering customers appear to have reasonable expectations but do not perceive civil engineering to be as responsive as desirable.

By validating Kirschbaum's model, this research provides a clear indication of which areas offer the most potential for improving customer satisfaction. In addition, it provides civil engineering with a report card by which to measure future improvements.

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